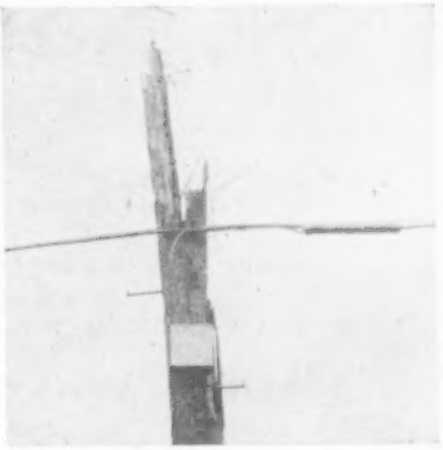
WHEN LIGHTNING STRIKES SPUN CABLE - - - - -

CRASH

HERE IT STRUCK TOP OF POLE AND TRAVELED ½ MI. LEAVING THRU A TERMINAL WITHOUT A SINGLE BURN IN CABLE SHEATH.

DAMAGE IS LESS



Spun Cable dissipates the charge easier. Cable sheath is not burned every few feet. This one advantage alone saves you many dollars in repair costs. Have you talked with your Jobber lately about Spinning Equipment.

CABLE SPINNING EQUIPMENT CO.

TOPEKA

TELEPHONY

The Journal of the Telephone Industry

DECEMBER 9, 1944

H. D. FARGO, JR. — *President and Advertising Manager*
R. C. RENO — *Vice-President and Editor*
A. J. STULTS — *Secretary and Western Manager*
H. D. FARGO — *Vice-President and Treasurer*
RAY BLAIN — *Technical Editor*
FRANCIS X. WELCH — *Washington Editor*
GLADYS HANSON — *News Editor*
MAYME WORKMAN — *Traffic Editor*

Published by
TELEPHONY PUBLISHING CORP.
608 So. Dearborn Street, CHICAGO (5)
Telephone Wabash 2435

SUBSCRIPTION—15 Cents a Copy (Except special issues); $3 a Year U. S. and Countries in U. S. Spanish Postal Zone; $4 Canada; $5 Other Countries.

IN THIS ISSUE

APPROVED MAINTENANCE PRACTICES—*By Daniel Seitz* 19
ABC OF THE TELEPHONE—*By Frank E. Lee* 21
IN THE NATION'S CAPITAL—*By Francis X. Welch* 25
BEST STORY OF THE WEEK 26
SMALL EXCHANGE CIRCUIT ANALYSIS—*By Harry E. Chapman* 28
MAINTENANCE KINKS 31
SMALL EXCHANGE STRUGGLE FOR EXISTENCE 34
By Norman M. Shenk
ANNUAL CONVENTION HELD BY SOUTH CAROLINIANS 38
TAXATION WITHOUT REALIZATION—*By Francis X. Welch* 42
THE PLANT MAN'S NOTEBOOK—*By Ray Blain* 52
DEHUMIDIFYING SWITCHROOMS IN THE TROPICS 56
By W. E. Nichols
TAR HEELS MEET AND LAY OUT FUTURE PLANS—*By George Rose* 66
THE OPERATOR'S CORNER—*By Mayme Workman* 74
WAC SUPERVISES DEPOT DIAL INSTALLATION 76
COURTS AND COMMISSIONS 80
OBITUARIES 93

Solves 3 Problems

FOR "ONE EXCHANGE" COMPANIES

With dial service fast gaining in favor, many small telephone companies operating single exchanges are facing these questions: "How can we use dial equipment to improve service and lower costs?" "If we convert to dial, how can we handle our toll and information calls?"

The Automatic Electric C - A - X (Community Automatic Exchange) brings the modern answer to these questions — solves the three problems which all small exchanges face today.

The simple three-point plan outlined here is bringing these benefits *right now* to many "one exchange" companies. It can do the same for your exchange. Give us a few facts about your property, and we shall be glad to help you plan, just as we have done for others.

AUTOMATIC ELECTRIC

Originators and Developers of Strowger Step-by-Step Machine Switching Automatic Dial Systems
Makers of Telephone, Signaling and Communication Apparatus . . . Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions

AUTOMATIC ELECTRIC SALES CORPORATION, 1033 W. Van Buren St., Chicago 7, U. S. A.
Export Distributors: INTERNATIONAL AUTOMATIC ELECTRIC CORPORATION

ARMY (E) NAVY

Approved Maintenance Practices

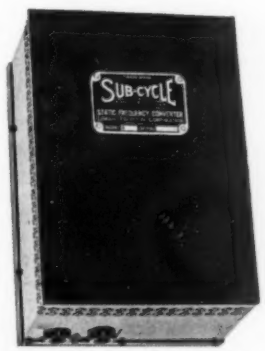
By DANIEL SEITZ
Cable Superintendent
York (Pa.) Telephone & Telegraph Co.

PART XXXV. In this article the author discusses the theory of the Sub-Cycle ringing converter and explains its method of operation without using any moving parts.

THE SUB-HARMONIC ringing generator, manufactured by Lorain (Ohio) Products Corp.—the Sub-Cycle—operates from the regular AC supply line, and converts the input frequency to the ringing frequency. The standard Sub-Cycle converters supply power at exactly one-third the input frequency, providing 20-cycle current from the 60-cycle line, or 16⅔-cycle current from a 50-cycle line.

These converters are made in a variety of sizes and types with output ratings from 7.5 to 45 watts, input voltages of 115 or 230 volts, and input frequencies of 50 or 60 cycles. One type of converter is provided with a reversible plug for changing the circuit to permit operation on either 50 or 60 cycles. Another type has a series of input taps permitting operation on any voltage from 95 to 270 volts. Nominal output voltages range from 90 to 130 volts. Moistureproofed converters are available for use in tropical climates or in humid locations. These converters are potted to provide complete protection against moisture, and all exposed metal parts are treated to prevent corrosion.

In the Sub-Cycle generator, the reduction of frequency is accomplished without moving parts, except for a relay, which operates when the converter is started and releases when it is stopped. The change in frequency depends on the action of a circuit including a condenser together with an inductance having a saturable magnetic core. In such a circuit, oscillations, sub-harmonically related to the input frequency, after they are once started, can be maintained by the interaction of the fundamental and subharmonic currents in the saturable inductance. The fundamentals of operation can be described best by considering the simplified circuit shown in *Fig. 1*, comprising a saturable inductance L in series with a condenser C and an alternating current generator G. The voltage of generator G is insufficient to saturate the inductance L and if the inductance is not saturated by a starting transient when the circuit is energized, the current flowing through the circuit will be relatively small and will consist of the normal exciting current of the inductance L. Condenser C has a much lower reactance than the unsaturated inductance so its effect in the circuit is scarcely noticeable under this condition.



Sub-Cycle master ringing converter.

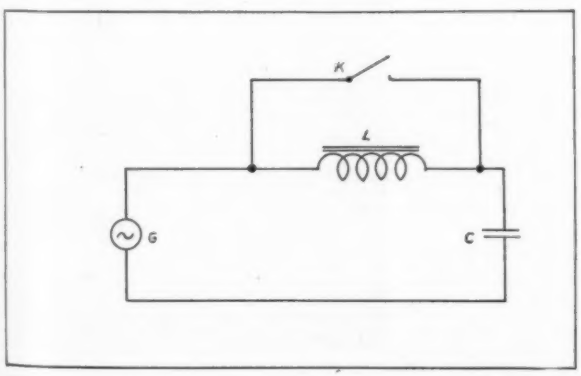


FIG. 1

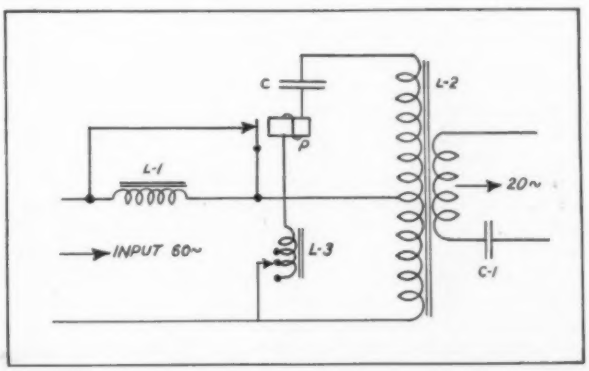
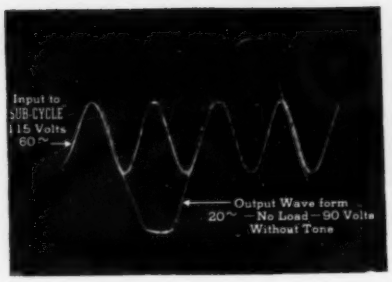
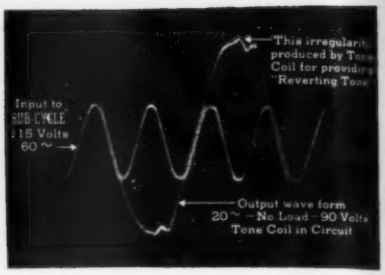


FIG. 2

To start sub-harmonic oscillations, key K is momentarily closed, shorting the inductance and putting the generator voltage on the condenser. When the key is reopened, the condenser usually retains more or less charge, depending on what point in the cycle the key is opened. If the key is opened when there is very little, or no charge, on the condenser, the shock produced in the circuit will be very weak and the condition existing before the key was operated will soon be re-established. However, when the key is opened while



(a)



(b)

FIG. 3

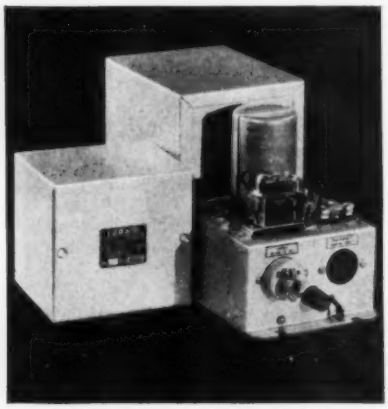


FIG. 4. DC-AC converter, 0.100 amperes, 20-cycle output.

there is considerable charge on the condenser, the charge tries to escape through the saturable inductance L.

The long time constant of the combination prevents any rapid loss of charge, and in the meantime the voltage of generator G is also applied to the inductance. This voltage produces current alternately aiding and opposing the condenser discharge current through the inductance. In the first half-cycle in which the generator current aids the condenser current, the sum of the two does not become great enough to saturate the inductance and the condenser does not lose much of its charge. The condenser discharge current continually increases during the opposing half-cycle of generator current, and then in the next aiding half-cycle of generator current, the sum of the two currents saturates the inductance, reducing its impedance to a small fraction of its initial value so that it draws a very large pulse of current from the generator, not merely discharging the condenser but actually recharging it fully in the opposite direction.

This sets the stage for a repetition of the original cycle of operation; the condenser does not discharge in the half-cycle following the half-cycle in which it has been charged, but waits through the opposing half-cycle until the next half-cycle in the direction to aid its discharge. That is to say, one half-cycle of condenser current flows for each three half-cycles of generator current and the voltage across the condenser is of one-third the generator frequency. By changing the values of capacitance and inductance in the circuit, other sub-harmonics, particularly the fifth sub-harmonic of the generator frequency, can be produced in the same circuit, but the third sub-harmonic is by far the easiest to produce and the most consistent in operation.

The current of the generator frequency, which flows in the circuit of *Fig. 1*, is generally less than the sub-harmonic current and of course the

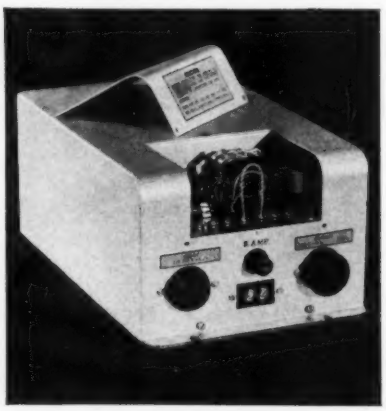


FIG. 5. Special potted unit with input voltage taps and audible alarm connections, with relay cover removed.

condenser has more reactance at the sub-harmonic than at the generator frequency, so the voltage across the condenser is predominantly sub-harmonic voltage, and a load may be supplied directly in parallel with the condenser.

The principle of operation of the commercial sub-harmonic generators is fundamentally the same as the operation of the simple series circuit of *Fig. 1*, but several refinements are added. The circuit shown in *Fig. 2* is that of a standard ringing generator. The relay R in *Fig. 2* performs the function of the key K in *Fig. 1*, shorting the saturable inductance L_1 as long as the relay is not energized. The voltage applied to the condenser C is stepped up by the transformer L_2, effecting a reduction in the capacity necessary.

When input power is applied to the circuit, the relay contacts short out L_1, so the line voltage is applied to the primary of transformer L_2 and is stepped up to condenser C through the small saturable inductance L_3 and the relay coil. The condenser current operates the relay, putting L_1 in the circuit and causing the oscillations to start in the same manner as in the simple series circuit.

The sub-harmonic voltage across the condenser appears across the output winding of transformer L_2, from which the ringing current is supplied. The normal current through the condenser holds the relay contacts open, and, if for any reason, the sub-harmonic oscillations should stop, the current drops to a very low value and the relay releases, shorting L_3, recharging the condenser and restarting the oscillations.

The core of transformer L_2 saturates in operation. The saturation of this core produces a stabilizing effect, keeping the output voltage nearly constant in spite of load variations or variations in the input voltage. At the same

(Please turn to page 72)

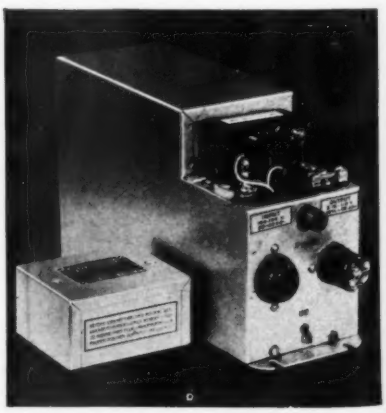


FIG. 6. 50-60 cycle, M-7.5 Sub-Cycle, with relay cover removed.

ABC of the Telephone

By FRANK E. LEE

PART VI. The Induction Coil. The fifth article in this series appeared in the October 14 issue, page 13.

THE PRECEDING installment on the telephone receiver discussed the permanent magnet. Proper operation of the receiver depends upon the permanent magnet maintaining the balance of the receiver diaphragm in a normal magnetic field. Further, the diaphragm is moved by the coil windings, momentarily strengthening or weakening the normal field.

The name "permanent magnet" is misleading. All so-called permanent magnets will lose part of their magnetism if they are: (1) Overheated; (2) vibrated; (3) brought into repulsive action of a more powerful magnetic force, or (4) placed in a continuing magnetic influence.

If the receiver is connected to a direct battery circuit, *Fig. 1*, a condition exists which in time will upset the normal magnetic balance of the receiver diaphragm. Whenever this circuit is in operation, push button closed, the direct battery current will flow in one direction through the receiver coil windings.

The resulting electromagnetic field will oppose or weaken the permanent magnetic field. When the direct battery current flows in the other direction, the tendency will be to strengthen the permanent magnetic field. Either condition is detrimental for the magnetic balance is upset, and the receiver response and efficiency will be lowered.

The induction coil is a piece of apparatus used in the telephone circuit to remove the receiver from the influence of the direct battery in the talking circuit. Also the induction coil transforms the fluctuating direct current created by the "sending" transmitter into an alternating current in the receiver circuit. Best operation of the receiver is assured when alternating current activates the receiver coil windings.

An alternating current is a current that flows first in one direction, then in the other. This change in direction may occur at regular intervals, such as 60 changes or cycles a minute as used in electric power circuits, or it may be in increased cycles without a definite pattern. Still the governing characteristic of complete change in direction classifies the current as an alternating current.

A simple induction coil—two individual windings of insulated wire placed upon the same iron core—is illustrated in *Fig. 2*. Winding 1 is connected to a battery and a push button and is labelled circuit 1. Winding 2 is connected to a meter in circuit 2. Inasmuch as the windings are of insulated wire there is no direct electrical connection between the two windings. Yet, it will be shown that the two windings are definitely coupled with each other.

There is no current flowing through circuit 1 because it is open at the push button. Circuit 2 is closed but there is no current flowing through it because it is not connected to a source of power. The absence of current flow in circuit 2 is indicated by the zero position of the meter needle.

With the operation of the push button, circuit 1 becomes a closed circuit and current flows through winding 1 in the direction as shown in *Fig. 3*. Further, it will be noted a momentary current in the secondary is indicated

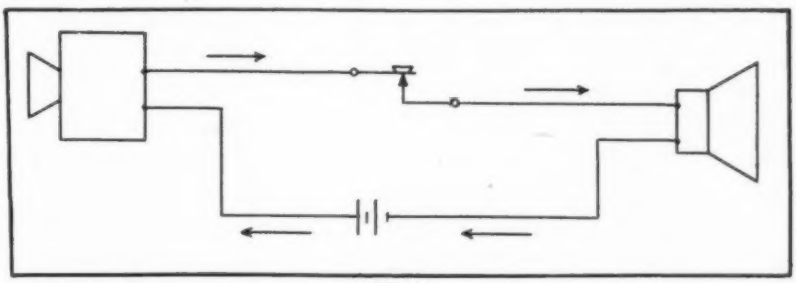


FIG. 1

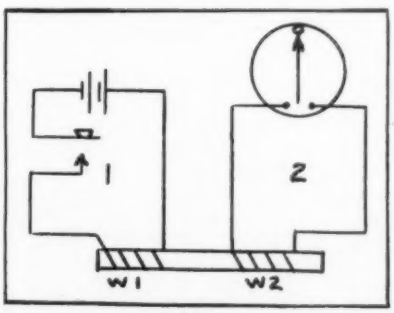


FIG. 2

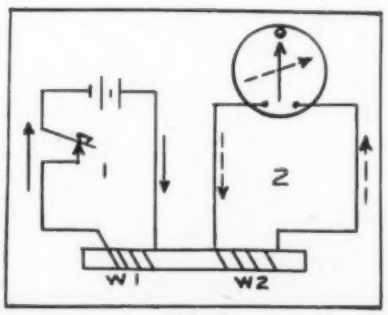


FIG. 3

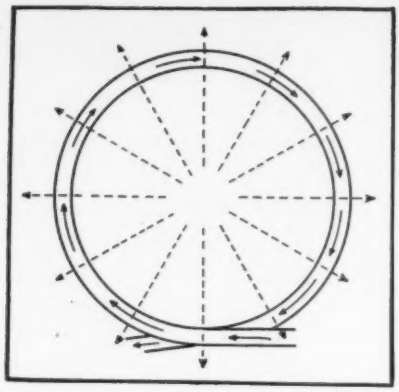


FIG. 4

by the meter needle momentarily moving away from zero the instant the push button was operated. The current flow in the secondary circuit was of short duration because the needle immediately returned to the original zero position.

In a previous installment it was explained that a magnetic field is present around a conductor through which a current of electricity was flowing. When a length of wire is formed into a solenoid or coil, the magnetic force around each of the turns adds together to form a coordinated field.

When a circuit is closed, as circuit 1 in *Fig. 3*, the magnetic field starts to build up. Where an instant before there was no magnetism, with the beginning of current flow the field starts to form. The field expands away from the coil until it reaches its strongest intensity. The intensity is governed by the amount of current flow through the coil windings. Although it takes but an instant for the current to reach its peak value, the magnetic field was expanding during that time.

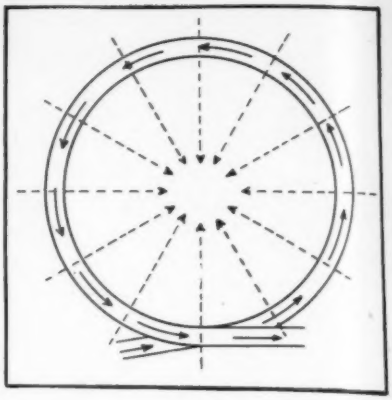


FIG. 7

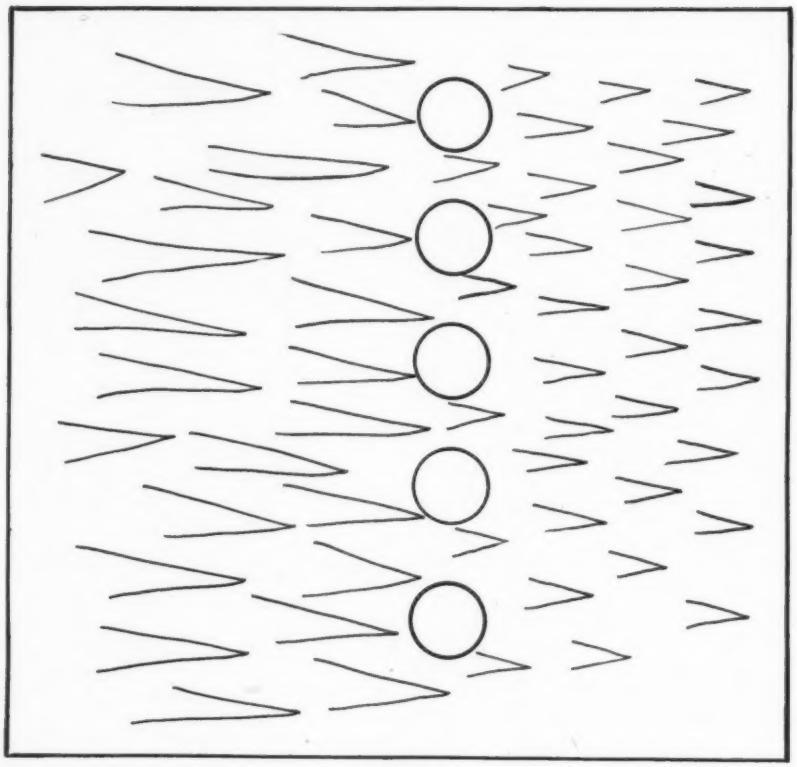


FIG. 5

A universal law of nature and physics expresses the thought that force and power is not lost. It may be misdirected or wasted but it is never a total loss. If a baseball is thrown high into the air it will travel upward until its propelling force is expended. Then the pull of gravity will start it on its downward journey. Upon reaching the ground the ball will strike with a force exactly equal to the force that threw it upward. With this thought of the return of power or force in mind, it is a simple step to believe that if current flowing through a wire creates a magnetic field, then a magnetic field moving around a wire will create a current in the wire.

The effect of the expanding magnetic field is to cut through winding 2. As the field is moving around the coil, current flows in winding 2. A sectional view of a turn of winding 2 is shown in *Fig. 4*. The expanding field has caused a current to flow in a clockwise direction. Further, the expanding field literally moves away from the iron core.

Winding 1 and winding 2 of the induction coil in *Fig. 2* are separated from each other to show the two separate windings. In practice the two windings are wound simualtaneously on the core. Therefore, the two windings are closely related.

Imagine a row of piling driven offshore from an ocean port. As the tide moves in *(Fig. 5)*, the sea flows through the pilings in one direction. The pilings represent the secondary winding of the coil. The moving sea simulates the expanding magnetic field. The effect of the magnetic field moving

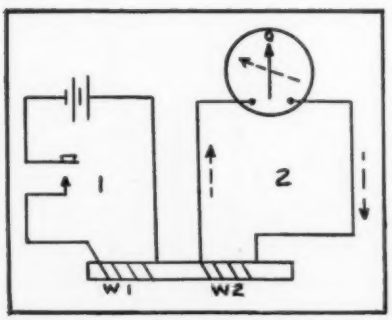


FIG. 6

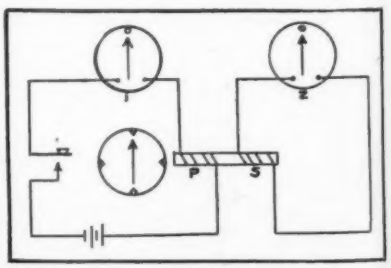


FIG. 8

through the secondary winding was registered by the meter *(Fig. 3)*. Once the magnetic field has expanded to its fullest extent it becomes stabilized and no longer moves around the secondary winding. Therefore, when the push button is held closed, the magnetic field remains stationary and no current is created in the secondary.

In *Fig. 6*, circuit 1 is opened by releasing the push button. The force that created magnetism in winding 1 has been stopped. But the magnetic field, unlike smoke that is dissipated in the air, tends to return to the iron core of the coil. At this time current flow through the coil is decreasing and the field is weakening or collapsing into the core.

The collapsing magnetic field cuts through winding 2 in a direction opposite to the expanding field. As a result, *(Fig. 7)* the current created in winding 2 is in a counter-clockwise direction. In *Fig 6* the meter needle connected in circuit 2 has again moved away from zero indicating a flow of current. However, as indicated by the direction arrows and the direction of the needle movement, the current flow is in the opposite direction. Again current was created in winding 2 only when the magnetic field was in motion. As long as circuit 1 remains open no current will flow in circuit 2.

In *Fig. 8* a meter has been placed in the No. 1 circuit. This is called the primary circuit (indicated by the letter P). The No. 2 circuit is called the secondary circuit (indicated by the letter S). A compass has been placed near one end of the induction coil. The primary circuit is open at the push button and the needle of meter 1 indicates no current is flowing in the circuit at this time. The needle of meter 2 indicates no current is flowing in the secondary circuit. The needle of the compass is not attracted towards the induction coil and indicates there is no magnetic effect produced by either coil.

Fig. 9 shows the same circuit just after the primary has been closed at the push button. The needle of meter 1 moves to the right and will remain in the same position as long as the circuit is closed. The needle of meter 2 moves momentarily to the right and returns immediately to zero. The needle of the compass is now pointing towards the induction coil, attracted by the magnetic field created by the coil. As long as circuit 1 is closed the induction coil will maintain the magnetic field and the compass will continue to point towards the coil.

Fig. 10 illustrates the conditions that exist when the push button in the primary circuit is opened. The needle of meter 1 has returned to zero. The needle of meter 2 swings away from zero, this time to the left, and returns immediately to zero. The needle of the compass has returned to its original position, indicating the induction coil has lost its magnetic field.

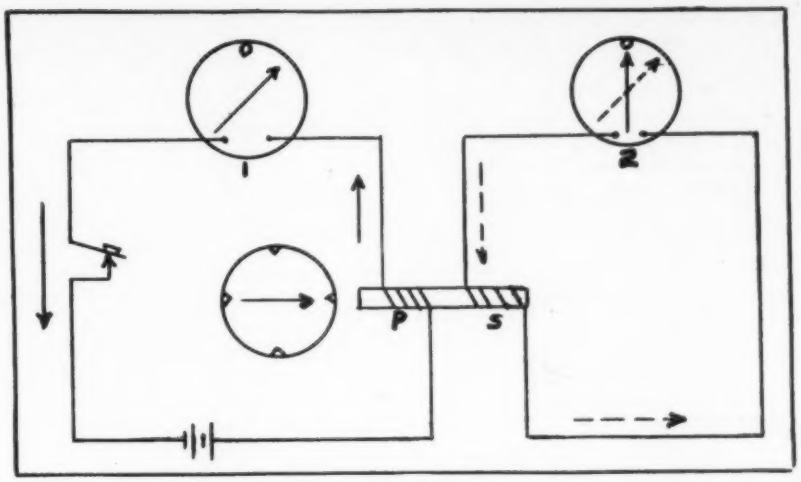


FIG. 9

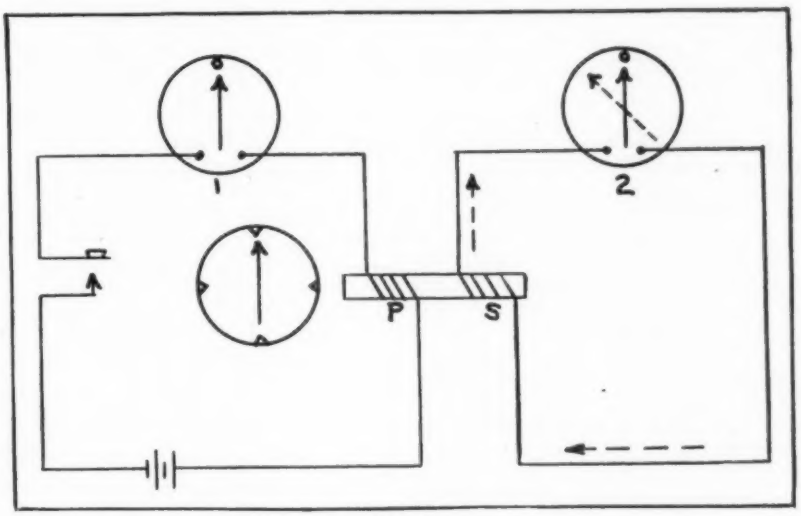


FIG. 10

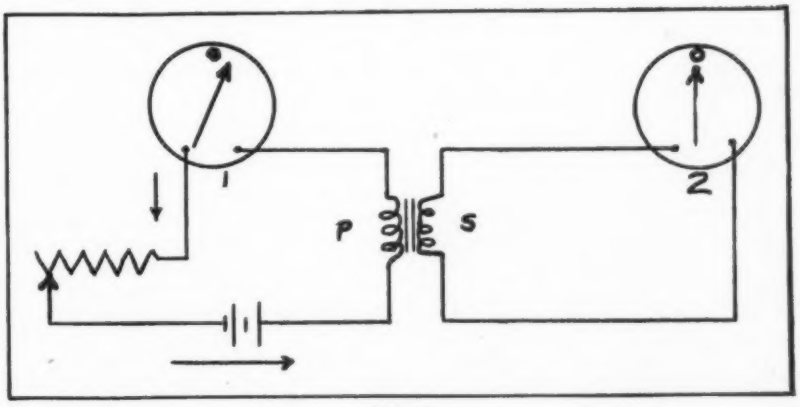


FIG. 11

The primary and secondary circuits are not directly connected together, but are coupled by magnetism. The current in the secondary circuit flows only when there is a change in the magnetic field set up by the primary circuit. When the magnetic field is increasing in strength, current flows in one direction

in the secondary circuit and conversely, when the magnetic field is decreasing in strength, current flows in the opposite direction in the secondary.

The current used in the primary circuit is a direct current because it flows in only one direction. The current in the secondary circuit flows first in one direction and then in the other and is called alternating current. The alternating current produced in the secondary circuit is called induced current, and from this the induction coil gets its name.

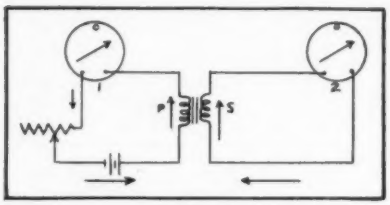


FIG. 12

The preceding experiments prove that when a change in the magnetic strength of the induction coil field is caused by opening and closing the push button, an alternating current is induced in the secondary winding of the induction coil. However, instead of opening or closing the primary circuit entirely, the strength of the magnetic field set up by the induction coil can either be increased or decreased by varying the amount of current flowing in the primary circuit. If the current flow in the primary winding is reduced, the magnetism will be weakened. At this time the field is collapsing. If the current flow in the primary winding is increased, the magnetic field will be expanding.

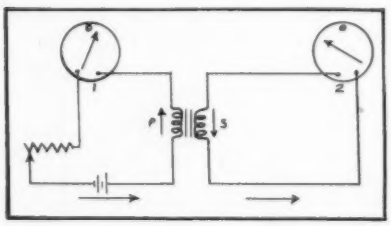


FIG. 13

In *Fig. 11* the induction coil is shown by its schematic symbol (two coiled lines, representing two windings of wire placed close together — the iron core represented by the two vertical lines). A rheostat has been inserted in the circuit in place of a push button. When the rheostat arm is in the position shown, the resistance of the primary circuit is high and the amount of current flow is low. Therefore, the magnetism produced by the induction coil is low. At this time there is no current flow in the secondary, because the magnetic field is unchanging.

In *Fig. 12* the rheostat arm is moving to the right, decreasing the resistance in the primary circuit. This increases the current flow and the strength of the magnetism. The needle of meter 2 moves to the right of zero, and remains in this position as long as the rheostat arm is in motion causing the magnetic field to change at a constant rate. The slow change in the magnetic field keeps the field in motion around the secondary winding. Therefore, the secondary current will flow while the field is in motion.

If the rheostat arm becomes stationary, causing the flow of current in the primary to become a constant factor, and thereby producing an unvarying magnetic field, the needle of meter 2 will drop back to zero, and remain in that position until the arm is again moved.

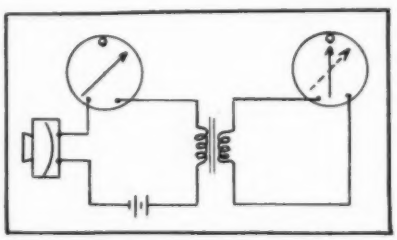


FIG. 14

In *Fig. 13* is shown the effect of increasing the resistance in the primary by moving the rheostat arm to the left. The current in the primary circuit is being reduced, weakening the magnetic field of the induction coil. The needle of meter 1 moves back gradually to the same position it occupied in *Fig. 11*. While the rheostat arm is moving, the needle of meter 2 takes a position to the left of zero as shown *(Fig. 13)*. As previously stated, when the arm stops, the current will cease to flow in the secondary circuit.

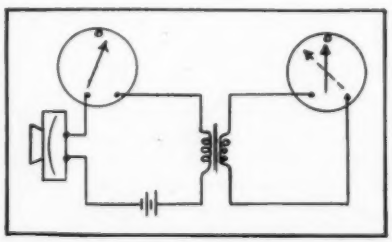


FIG. 15

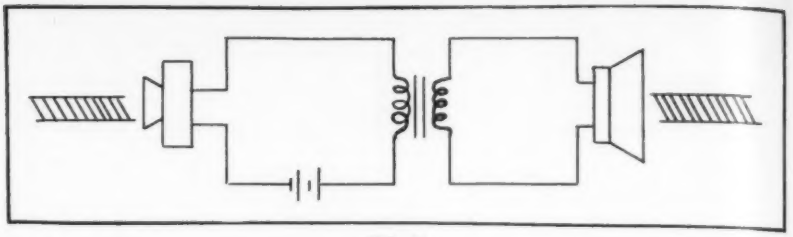


FIG. 16

In brief: The above experiments demonstrate that if the strength of the current in the primary winding of an induction coil is successively increased and decreased, alternating current will be produced in the secondary circuit.

In *Fig. 14* a transmitter has been inserted into the primary circuit. With the transmitter diaphragm in its normal position, a steady current will flow in the primary circuit. Under these conditions the magnetism of the induction coil will be unchanging and no current will flow in the secondary. When the diaphragm is pressed in, as indicated, the current flow in the primary will be increased and cause a flow of current in the secondary. The needle of meter 2 will move for a moment to the right and return to zero.

In *Fig. 15* the diaphragm of the transmitter is moving outward. The current in the primary is reduced. The magnetic field is collapsing and a momentary current, in the opposite direction, is induced in the secondary circuit.

In the process of changing sound waves into electrical impulses, the transmitter creates a fluctuating direct current with hundreds, even thousands, of variations every second. These direct current fluctuations are reflected in the expansion and collapsing of the magnetic field produced by the primary induction coil winding. The alternating current in the secondary circuit follows the magnetic field. Therefore, the receiver diaphragm moves with the same frequency and in direct relationship with the sending transmitter diaphragm.

When a tone is impressed upon the transmitter *(Fig. 16)*, the receiver will faithfully reproduce the same tone. The induction coil improves the receiver response by sending alternating current through the receiver windings. At the same time the receiver, removed from the influence of direct battery, will retain its fidelity over an extended length of time.

(To Be Continued)

"Checks and balances" theory of United States government, with regard to the Illinois Commercial Telephone Co. case before NWLB, would seem to be no longer as effective as heretofore. . . . Means for relief under such WLB decision listed. . . . Mr. Welch also suggests amendment to labor board's appropriation bill.

THE CONSTITUTION of the United States, as in the case of any other governmental constitution worthy of the name, is designed to operate on a series of what the lawyers call "checks and balances." The United States government is composed of three coordinate branches of the government, each theoretically of equal rank. The idea of this tripod arrangement for the basis of our constitutional government is to insure that the rights and liberties of our people do not fall under the exclusive control of any one branch.

In practice, this is supposed to work out in such a way that the executive, the judiciary, and the legislative branches, each in its own respective sphere, are in a position to checkmate any abuse on the part of the other coordinate branches. Thus, if Congress passed a law expressly contrary to certain constitutional guaranties, the Supreme Court could throw it out. But if the courts start throwing out too many laws without sufficient reason in the opinion of Congress, Congress could either change the composition of the court itself by statute, or pass a proposed constitutional amendment giving the people themselves the right to put powers into the Constitution which the court held were not there.

The executive branch likewise has, through its appointive powers and administrative control of the government, both the authority and the opportunity to check the other branches. It can itself be checked, in turn, through Congressional control of the purse strings and outright statutory change. The courts can likewise check administrative abuse and have done so in numerous instances in the past.

* * *

But something has happened during recent years to this fine theory of "checks and balances" of which the great Thomas Jefferson and his coworkers were so proud when they finished the final draft of the "supreme law of the land." It may be hard to believe, but *today a businessman can be tried by a certain tribunal on charges which may involve seizure of his business by the government and even fines and imprisonment, without the right to appeal to a court of law or demand a jury trial. What is more, this same tribunal is in a position to make its own laws in complete disregard of the expressed will of Congress,* as evidenced by a statute in the federal code books. For this defiance, there is apparently no practical check or counterbalance either in Congress or in the courts.

The reference is to the National War Labor Board, which on November 24, by a vote of 8 to 4 (industry members dissenting), dismissed a petition of the Illinois Commercial Telephone Co., Springfield, to review a regional WLB order requiring the employers of telephone operators at exchanges serving less than 500 stations to reduce certain working hours per week. [TELEPHONY, December 2, page 27.]

The reason this decision is an open defiance of the will of Congress and the law of the United States, as expressed by a very clear Congressional enactment, can be summed up in three short progressive points:

(1) Operators in telephone exchanges serving less than 500 subscribers are exempt from the requirements of the Fair Labor Standards Act (Wage-Hour Law) as the result of a Congressional statute amending that act, the only amendment to that act which has ever been passed by Congress and one which was passed upon the request and urgent pleading of thousands of small Independent telephone companies throughout the United States in 1939.

(2) The executive order (No. 9250) which set up the National War Labor Board in the first place expressly provided, "Nothing in this act shall be construed as affecting the present operation of the Fair Labor Standards Act," etc.

(3) Subsequently the War Labor Disputes Act, passed by Congress, gave statutory authority to the War Labor

Board with the following restriction: "In making any such decision the board shall conform to the provisions of the Fair Labor Standards Act of 1938, *as amended.*"

It ought to be clear enough from this fairly simple language that Congress wanted the War Labor Board to decide cases in such a way as not to conflict with the provisions of the Fair Labor Standards Act *"as amended."* Inasmuch as there is only one amendment to the Fair Labor Standards Act (and that is the one exempting the operators of these small telephone exchanges from wage-hour requirements), it is hard to conceive just what justification the majority of the War Labor Board can make of its action in over-riding the clear intent of Congress.

The most difficult angle of this case is that, under recent decisions of the Federal courts, no appeals are allowed to be taken to the federal courts on the merits of questions decided by the War Labor Board. The theory of this denial of the usual right of appellate review, or judicial relief, from administrative abuse is that a war emergency justifies the temporary suspension (for the duration and shortly after) of the usual constitutional right of having one's day in court.

In this case we see where the removal of this safeguard from the series of "checks and balances" leads us. For it is obvious that, if an administrative board can defy the will of Congress and is immune from the supervision of the judiciary, it is responsible to no one except the power which appointed it: The chief executive. What kind of democracy is this? Who elected the members of the War Labor Board to office? By what right do they presume to ignore the wish of Congress while blind justice in the court room tightens the bandage on her eyes and turns her head the other way? What relief is possibly left to the small telephone exchanges to escape from such arbitrary treatment?

Obviously, it would seem to be almost futile to go back to Congress for another law because Congress has already done all it could to make itself clear. If the WLB disregarded the first law, it could doubtless disregard the second and, for that matter, the third, or any successive series of enactments. Further appeal within the administrative branch is no longer possible because the Illinis Commercial Telephone Co. has already exhausted all its remedies under the War Labor Board procedure to no avail.

Even if the manager of one of this company's small exchanges were to refuse to obey this order, and the government had to seize the plant manager and have him carried out in the arms of a couple of soldiers (as Sewell Avery was carried out of the office of Montgomery Ward several months ago), the clear outlook is that, for all his pains, he would get no court review on the merits of the case. And more likely he might draw a stiff fine and even a stretch in jail. This, because the federal courts have decided, as stated before, to entertain no review on the merits of such cases and will lend their judicial authority only to the promulgation and enforcement of the WLB orders.

This is not a solitary instance of arbitrary government by men rather than laws through a perversion of our constitutional system of "checks and balances." The judicial branch of our government, for example, has become so subservient to the will of the administrative branch that it has even approved of administrative interpretation of laws with regard to points upon which Congress has not even had the opportunity to declare itself.

Some time ago Congress passed the "anti-racketeering" act which made it a federal crime to extort money under threat of violence. Yet when an attempt was made to convict certain striking truck drivers from using their picket lines at the end of an interstate bridge as a device for shaking down and collecting certain "dues" from truck drivers crossing the bridge, under threat of bodily injury, the court found that, although such violence was reprehensible, the anti-racketeering law was not intended to cover such racketeering by organized labor unions.

One can look from the first word to the last word of the anti-racketeering act and find not a single place where an exception is made for exemption of labor unions or their members. Congress simply had not spoken on that point at all. The only way the union member immunity could be interpreted was by the quite dubious implication. Now it will be necessary for Congress itself to rewrite the law; it will probably do so sooner or later, to say, in effect, "Yes, *we do so* mean union racketeers as well as any other racketeers."

The same thing happened when an attempt was made to convict labor unions of violating the anti-trust laws. The court found that these laws, which have been on the statute books for a good many years, were not intended to cover monopolistic practices or other unfair restraints of trade, as long as they were performed by labor union groups. Yet you will find no such language in the law. It will be necessary some day for Congress to underscore its own intent by passing another law saying again in effect, "Yes, *we do so* mean labor unions as well as anybody else who engages in monopoly." Until then we will have such things as Music Czar Petrillo defying everybody, including the President of the United States, and getting away with it.

It would seem to be the modern rule of construction, in interpreting an act of Congress, to hold that any interpretation favoring the interest of labor, no matter how far-fetched, must be indulged, while any interpretation contrary to such interest, no matter how plainly substantiated by the word of Congress itself, can be disregarded with impunity. Result: You'll never see Petrillo carried out of his office by a couple of soldiers. And don't blame Petrillo personally. He's just taking full advantage of the immunity which the Supreme Court has given to tax-exempt labor unions from criminal laws and other restrictions which apply to all the rest of us poor taxpayers.

In other fields than labor law, we witness a similar disregard of Congressional intent. Last year, for exanple, certain congressmen from California, acting on complaint of their constituents, wrote directly into the Interior Department Appropriations Bill a restriction to prevent Secretary of Interior Ickes from building a certain transmission line. Ickes went ahead and built the line, anyway. When he

Best Story of the Week — What's Yours?

E. E. Sanders of The Concord (N. C.) Telephone Co., tells the following best story which occurred recently at the Kannapolis, N. C., exchange of the Concord company.

A negro woman called the business office and, after asking for Information, said, "We had an old cow to die last night, can you tell me the man's name and the telephone number that lives out on Shank Road who fixes up cow's horns?"

The cashier who answered said: "No, we do not have such information."

The customer said: "Who do then?"

Cashier: "Possibly the city abattoir."

Negro woman: "Whose dat?"

Cashier: "The man who kills cows."

Negro woman: "Oh, my cow's already dead. Good-bye."

was called on the carpet by the Congressional committee, he laughed in their faces, pointing out that he had constructed the line from unexpended funds previously authorized. For him, the theory of "checks and balances" seems to mean "government by blank checks and unexpended balances."

Almost daily we are witnessing in Washington an accumulation of incidents which bear the unwholesome odor of privileged interest grown stale in power but too entrenched to fear displacement. We witness a series of developments suggesting the arrogant attitude of certain persons who consider themselves above the ordinary rules and conventions which apply to the rank and file of citizens. Just last week, for example, the second counsel for the special House committee investigating the Federal Communications Commission resigned in protest for the same reason that the first counsel resigned. He refused, according to his own words, to "have it on his conscience that he took part in a whitewash."

What was the reason for this protest? The investigation of the unsavory WMCA radio sale which has been long deferred (and once obviously put over until after the elections), by a 2 to 3 vote of the committee, was reserved for "secret sessions." Why? Because the testimony threatened to involve prominent personalities in high favor with the administration. There is no point in discussing here such details of the smelly WMCA case as are known, for the simple reason that the true facts probably *never will* become public, now that we are assured of another four years of suppression with respect to this sort of thing. Suffice it to say that the case certainly reflects no credit on the FCC under the recent chairmanship of James L. Fly.

Like a breath of fresh air was the still more recent announcement of Acting Chairman E. K. Jett that the FCC would cooperate fully and openly with the House investigating committee. The trouble is, Jett probably will never get a chance to do so. All signs point to an administration drive to kill the continuation of this special investigating committee in the next Congress which meets in January. The chances are excellent that the committee will be killed.

Also, last week we saw another case where an assistant attorney general was frank enough to tell another Congressional committee (this time in the Senate) that he could no longer have confidence in his own superior (the Attorney General) because the latter attempted to high pressure him into settling a certain government case out of court where the parties on the other side were represented by a law firm of ex-Brain Trusters. The President of the United States had to take action in such an open conflict because the Attorney General asked his assistant to resign and he refused to do so.

Who was fired? The official who wanted to follow his conscience? Or the one who is represented as wanting to yield to pressure? You have read the papers and know the answer, and it is still smelling around Washington.

* * *

Coming back to our own Independent telephone problem resulting from the WLB decision in the Illinois Commercial Telephone case, there is this much to be said by way of sober analysis of the situation:

(1) The decision only applies to exchanges of the Illinois Commercial Telephone Co. and so far does not apply to any other telephone company. However, the precedent is such that it is only realistic to expect that a similar rule will be followed in other cases if, as and when they arise before the War Labor Board.

(2) Decisions of the War Labor Board are not permanent and have nothing to do with the work of the Wage-Hour Administrator from whose authority less-than-500-exchange operators are still exempt. But as a practical matter, everyone knows that the adjustment of wage-hour standards, whether by voluntary action of the employer or otherwise, and whether for the duration of the war or otherwise, is like the fall of Humpty Dumpty. Once the prevailing standards have been swept away, all the king's horses and all the king's men are not going to be able to put them back together again after the war emergency has passed.

(3) The Independent telephone industry might try to carry its case back to Congress and secure an amendment to the War Labor Disputes Act, similar to that already prevailing in the Fair Labor Standards Act, exempting from the WLB jurisdiction wage-hour disputes concerning operators on small telephone exchanges of less than 500 stations. The trouble with that approach is that, while a number of Congressmen, including the authors of the original 1939 amendment to the Fair Labor Standards Act, will doubtless resent the defiance of the WLB of the clear Congressional intent, any such amendment standing by itself would be sent to the Labor committees of both houses of Congress. Further, these bills would be, rightly or wrongly, labeled "anti-labor" and, because of the atmosphere which has prevailed in these two labor committees, might well linger there in committee pigeonholes until long after the war and the War Labor Board have passed away. There is no harm trying, of course.

(4) A more practical and promising approach might be made through the appropriations committees of both houses of Congress when bills are called up to provide funds for the War Labor Board. Committee members so inclined might question the justification of the WLB representatives for such a decision as the Illinois Commercial case. And if no satisfactory explanation were given, the committee could write into the bill a restriction against the use of the appropriated funds for carrying out any order of the board which contravened a federal statute. This has been done before.

Elaborating somewhat on the last point, it may be recalled that the same approach was used by Congress a few years ago when the FCC insisted on retaining a couple employes regarded by Congress as having subversive tendencies. The restriction was written into the FCC Appropriation Bill and there was all sorts of talk about court tests. But the fact remains that these employes are no longer with the FCC today.

In the case of the FCC employes, the use of the purse-string restriction was even more debatable than it would be in the case of the Illinois Commercial decision. In the former instance, a good argument could be made that Congress was encroaching upon the appointive power of the administrative branch. But in the latter instance, Congress would merely be insisting upon obedience to a law which it had itself written. Such an amendment to the WLB appropriation might read something like this:

"No part of the funds appropriated in this act shall be used to promulgate or enforce any decision of the board (WLB) which does not comply with the intent of Congress, as indicated in the Fair Labor Standards Act *as amended*, specifically with reference to the exemption of operators employed at telephone exchanges serving less than 500 subscribers."

Summing up this pessimistic department, your correspondent does not wish to imply that from all the discouraging signs we see in Washington today, there is any real question of doubt in the efficacy of our democratic process. Public servants, and their favorites, grown old in office and power have a tendency to take a lot for granted and occasionally act quite arbitrarily. But it is of the essence of our faith in democracy to assume that eventually the will of the people will catch up with all abuse, privilege, and even corruption where it exists.

As the immortal Lincoln once said, "You can't fool all of the people all of the time." True enough, but some characters in Washington seem to be hanging up a record that is going to stand a long time.

SMALL EXCHANGE CIRCUIT ANALYSIS

By Harry E. Chapman

Chief Dial Switchman, Intra-State Telephone Co., Galesburg, Ill.

IN THIS installment we shall describe the Stromberg-Carlson, anti-side tone operator's telephone circuit. In this circuit, battery is furnished the transmitter through two impedance coils, one of which serves as a relay, shown as No. 2 in *Fig. 1*. When the operator's plug is inserted in a jack the transmitter is connected in series with the 100-ohm impedance, relay No. 2 to battery, *Fig. 2*. The other side of the transmitter connects to one side of the primary of the induction coil, through the other 100-ohm impedance coil (1) to ground. This will cause relay No. 2 to operate and connect the operator's circuit to the listening keys of the cord circuit as shown in *Fig. 4*.

PART XII. The 11th article in this series appeared in the October 7 issue, page 24.

When the operator inserts an answering cord in a line jack and operates the listening key, she is ready to answer the call. The voice current as set-up by the operator speaking into the transmitter flows as follows: From the transmitter through the condenser in *Fig. 3*, to the primary winding of the induction coil, which consists of two identical windings connected in parallel. Part of this voice current will flow through each winding and back to the transmitter. The voice current will not reach the battery due to the high impedance to voice current of the No. 1

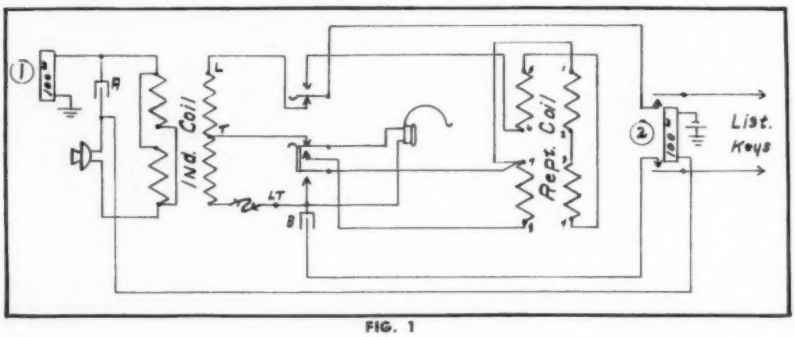


FIG. 1

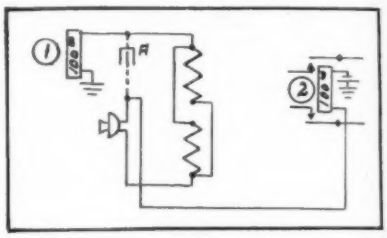


FIG. 2

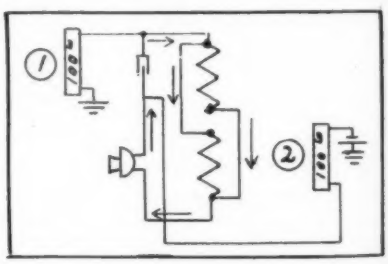


FIG. 3

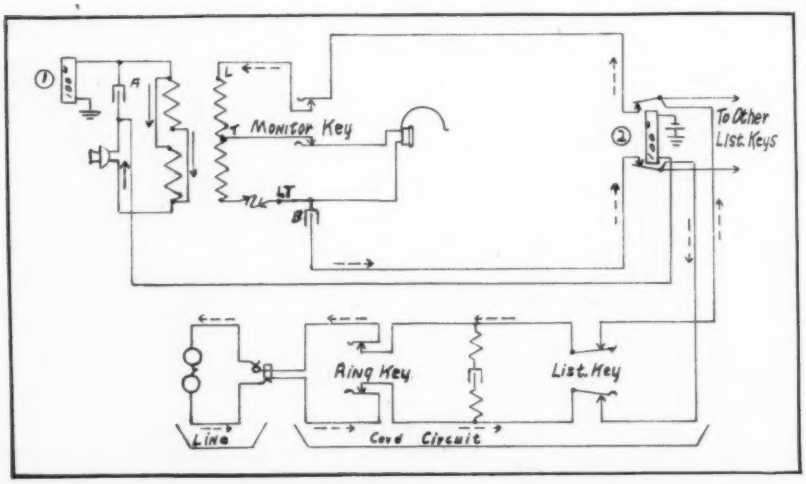


FIG. 4

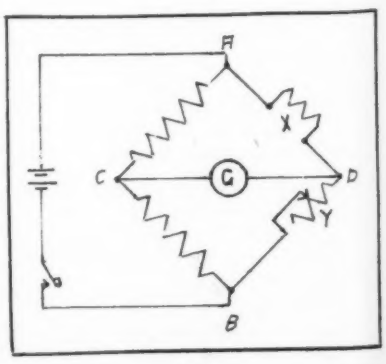


FIG. 5

coil and the No. 2 impedance relay.

The pulsating current in the primary will cause an alternating current to be induced in the secondary winding of the coil, *Fig. 4*. This induced current in the secondary will flow from T of the induction coil, through the regular and non-inductive winding to LT, through condenser B and contact of relay No. 2, through the ring side of the listening key and ringing key to the ring of the answering cord, through the line and the subscriber's telephone and back to the tip side of the answering cord. The return is over a similar path on the tip side of the line to T of the induction coil.

The anti-side tone induction coil is similar in principle to the Wheatstone bridge circuit, a simple arrangement of which is shown in *Fig. 5*. If resistance A and C is equal to resistance A and D and resistance Y has been adjusted to equal resistance X, which is generally termed the "unknown" resist-

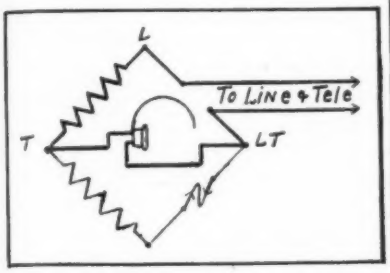


FIG. 7A

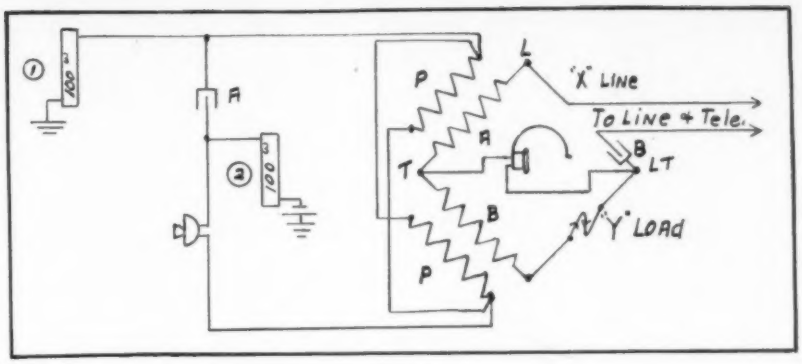


FIG. 6

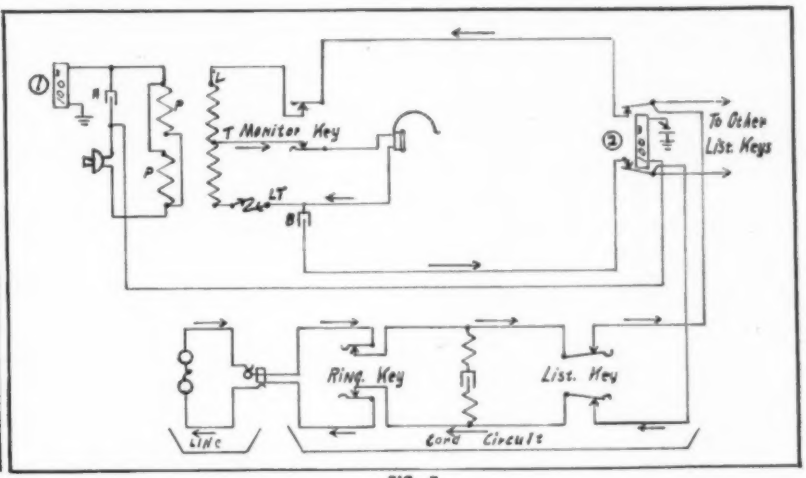


FIG. 7

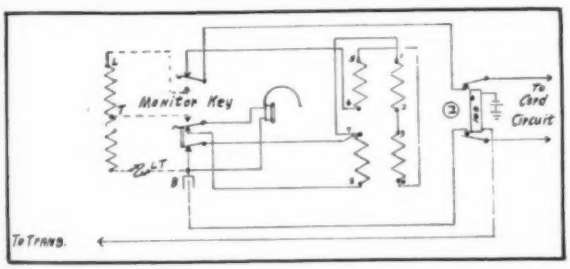


FIG. 8

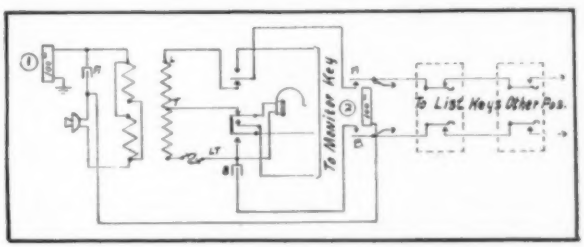


FIG. 9

ance, we will find that no current flows through the Galvanometer. Arranging the pattern of the telephone circuit *(Fig. 4)*, similar to that shown in *Fig. 6*, with the telephone line and subscriber's instrument representing the "unknown" resistance X, and the non-inductive winding of the induction coil representing Y, the purpose of which is to serve as an artificial line to balance as near as possible the average line, we have a Wheatstone bridge circuit. It will be found impossible, of course, to obtain a balance for all lines but an average is near enough to serve all practical purposes. It will be noted that the voice current induced in section A of the secondary of the induction

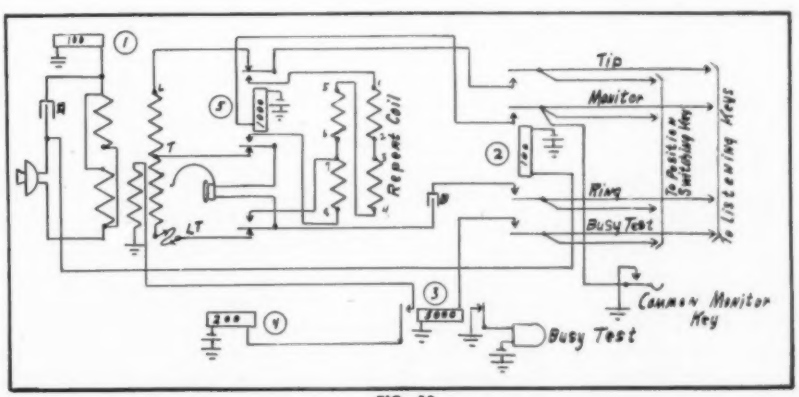


FIG. 10

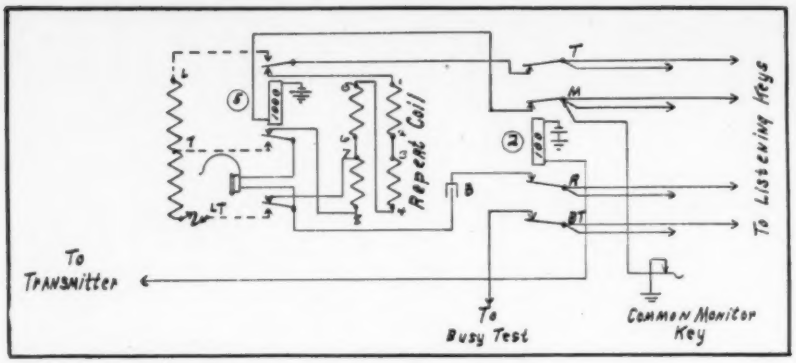


FIG. 11

coil *(Fig. 6)* by one primary winding is equal to that induced into section B by the other primary winding.

The artificial line being approximately equal to the actual line, there will be only a small current flow through the receiver. Under ordinary conditions it is impossible to make an operator's receiver completely silent, due to the fact that the artificial line cannot accurately balance all lines. However, the small voice current which reaches the operator's ear serves only to indicate that the circuit is in working order. The nearer the line is in balance with the load winding Y of the induction coil, the less side tone is apparent in the operator's receiver. The greater the unbalance, the more noticeable the side tone.

The incoming voice current is made clear in *Fig. 7*. The voice current from the subscriber's telephone travels over the same path as that of the outgoing talking current. The incoming voice current does not pass through the inductive and non-inductive winding T and LT. Because of the high impedance *(Fig. 7A)*, the receiver offers a path of much less resistance. It, therefore, takes this path instead.

To permit an operator to listen in on a connection without disturbing the efficiency of the circuit, a monitoring key is provided. To monitor a circuit, the listening key of the cord pair used to set up the circuit is thrown to the listening position, and the position monitoring key to its operated position. This removes the secondary of the induction coil from the circuit as shown in dotted lines in *Fig. 8*. This action also cuts in a high impedance repeating coil. The impedance of the three windings which act as a primary, is so high that very little talking current is robbed from the connection. The ratio of this primary to the secondary (7-8 winding) will cause an induced current strong enough to permit hearing of the conversation.

In exchanges having a switchboard of more than one position, there are times when the load is so light that only one operator will be required. When it is necessary for this operator to use the cords in the next position, it is only necessary to operate the switching key to connect the listening key commons in one position to those of the other. Removing the plug of the operator's set from the jack, disconnects battery from the primary circuit. Relay No. 2 is in series with the talking battery and as this circuit is opened, it restores to normal opening contacts A and B *(Fig. 9)*. This removes the secondary of the operator's circuit from the listening key commons.

The operator's circuit, shown in *Fig. 10*, differs from that just described in that one monitor key is provided, common to all keys. This key operates a relay which disconnects the induction coil from the circuit and in turn connects repeating coil windings 1-2, 3-4, and 5-6 in series, directly across the telephone circuit. The operator's receiver, connected across windings 7-8, is also connected to terminal No. 6 of the repeating coil. The coil connected in this manner acts as a high-impedance auto-transformer. This arrangement permits the operator's receiver being connected across the line and permits supervision without causing interference or indicating to the subscriber that the line is being observed.

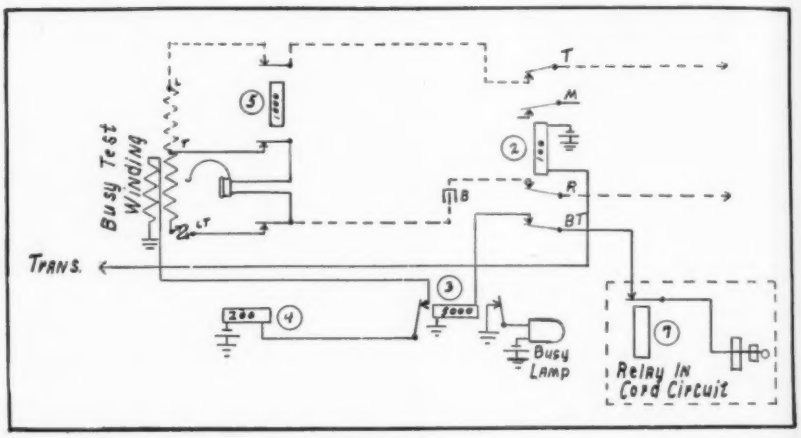


FIG. 12

A busy line is indicated when the operator plugs into the jack. Battery from the line as it meets the tip of the plug will pull the 5,000-ohm relay of the operator's circuit *(Fig. 12)*, causing the busy lamp to light. This will also close the circuit from battery through the 200-ohm winding of coil No. 4 of the operator's circuit to the test winding and ground at the induction coil. This busy test is merely another winding or secondary placed on the induction coil. When the circuit is closed from the busy test relay, a tone is heard in the operator's receiver as the busy lamp is lighted. The operator is warned of a busy line as soon as she plugs into it without looking directly at the busy lamp.

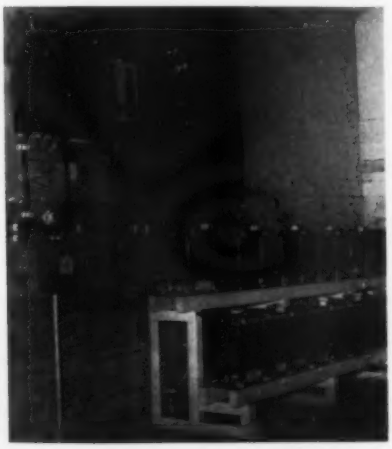
(To Be Continued)

Mistaken Identity

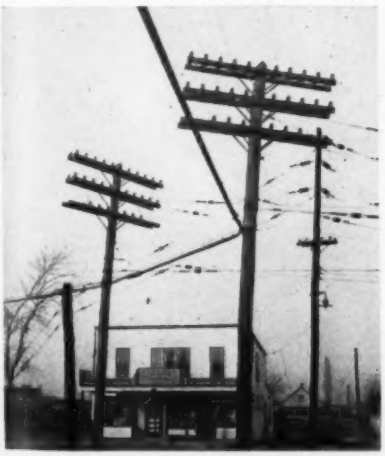
After a British column had taken the Dutch town of Valkenswaard, a call came through to the mayor's office from the German commandant in nearby Eindhoven who thought he was talking to fellow Germans. The village, he said, must be held at all cost. By all means, a British officer assured him. It *was* held at very little cost—by the British.

Maintenance Kinks

A very good view of a long-span rural line with wires strong on brackets. Note the good husky poles used.

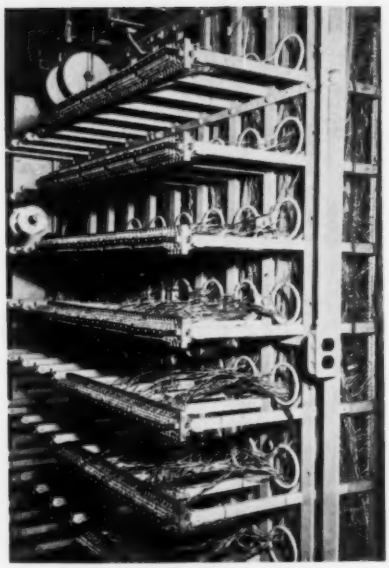


STORAGE BATTERY INSTALLATION: The above photograph shows a neat storage battery installation for a small automatic telephone exchange. Note the attractive step-type battery rack which was supplied by the battery manufacturer at a cost lower than it possibly could have been constructed locally. The rectifier is provided for charging on the float basis.

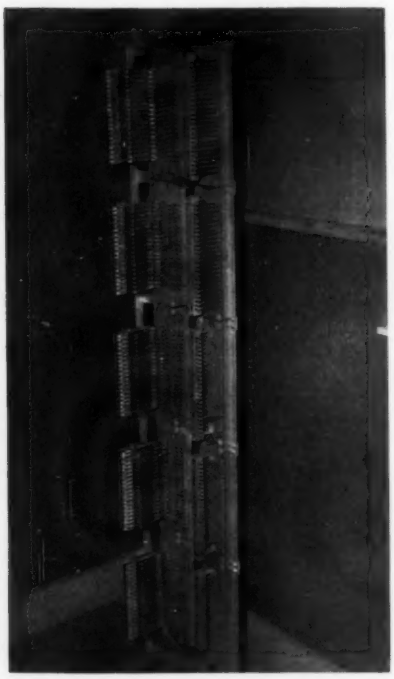


STRAIN INSULATORS: The use of strain insulators in guys is often neglected due to the cost and work involved. This practice should be carefully considered on every construction job if maximum plant life is to be expected. The above photograph shows strain insulators cut in telephone guy wires when installed near power lines.

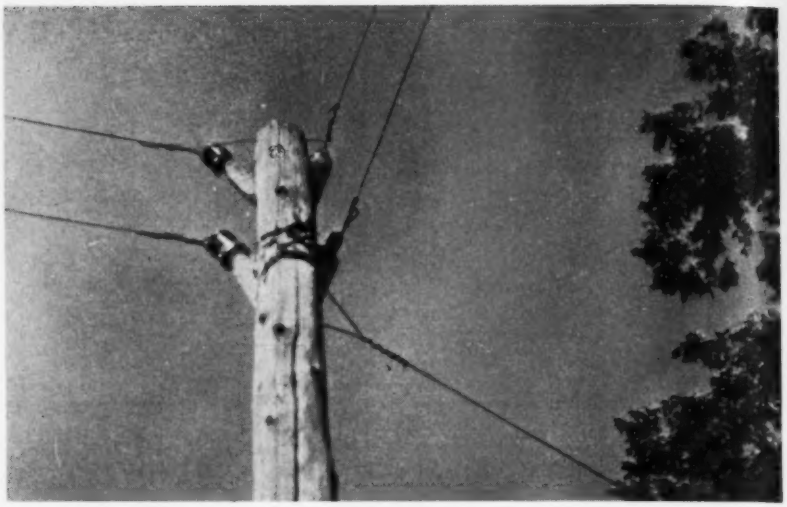
Power parrallels on rural lines should be avoided when possible. When these parallels cannot be avoided, the separation should be as much as possible. In this case, the telephone line is on opposite side of the road from the power line.



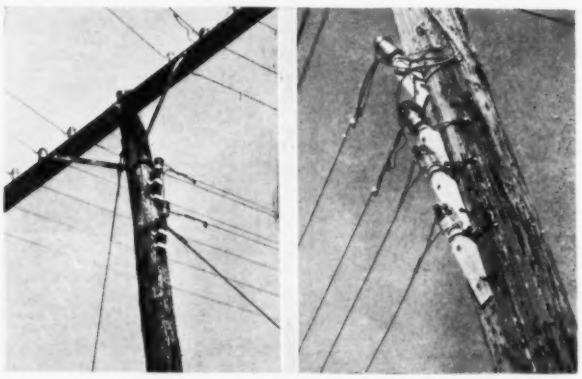
MAIN FRAME ACCESSORIES: Much may be contributed to good main frame maintenance by providing certain conveniences for the workers. All telephone main frames should have an outlet conveniently located so that soldering irons may be heated quickly. Reels for jumper wire and solder should also be properly and conveniently located. A good arrangement for these accessories is indicated in the above photograph.



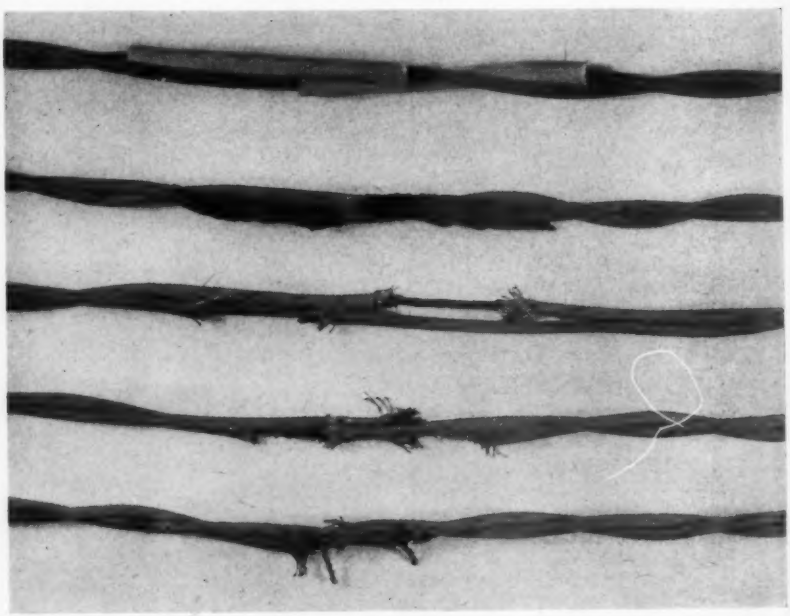
WALL TYPE MAIN FRAME: The small wall type main frame of the style shown in the above photograph can often be used to advantage in connection with any small switchboard. The floor mounting type main frame is not usually considered necessary for less than 300 cable pairs except in cases where the ultimate capacity of a system is expected to exceed the maximum capacity of an ordinary wall type frame.



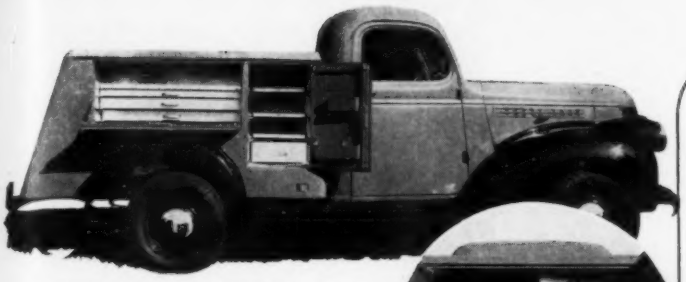
Type of corner using wood brackets for dead-ends. Note that heavy iron wire is used for a guy.

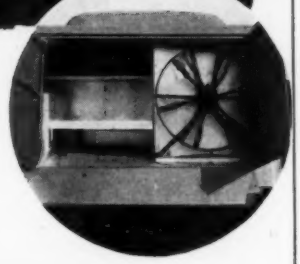


Two methods of reinforcing brackets for dead-ending. Left, special metal cleats. Right, wire wrapped around bracket and stapled to the pole.



Various methods of splicing house wire by the use of compression type sleeves. Note that the splices may be taped for insulation or covered with a cable-splicing-type, wool sleeve.





YORK-HOOVER MODEL 2050 Light Service and Installation Body for ½ ton commercial chassis. Note: Three pull out drawers with adjustable partitions, also additional material drawers with three sliding apparatus trays in front compartment.

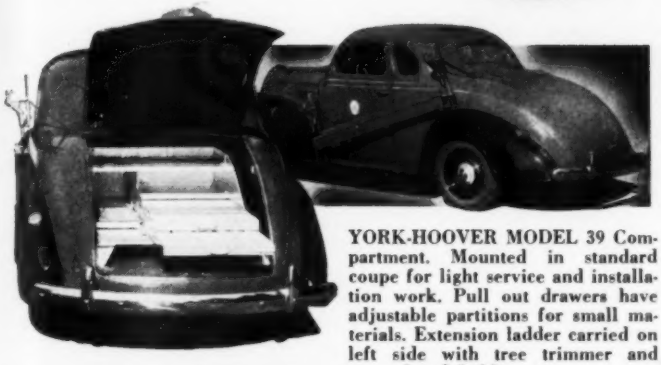
YORK-HOOVER ALL STEEL BODIES AVAILABLE TODAY

If you have the chassis and need new equipment . . . light or medium duty service bodies, York-Hoover can deliver a limited number of them today.

The performance ability of these bodies has been proven during our war emergency. York-Hoover bodies are turning in enviable records for efficiency and toughness, proving that skilled engineering and the right materials, plus long years of experience, are your best insurance for consistent trouble-free operation.

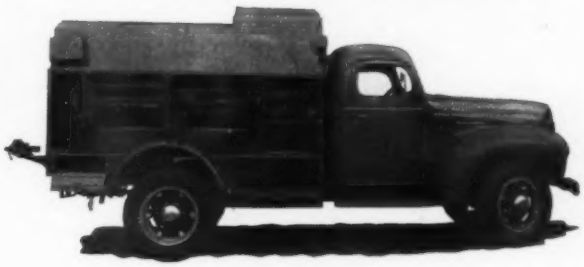
York-Hoover engineers will gladly help you with your future plans. Our engineers are designing body equipment incorporating all of the old and proven York-Hoover features, plus the new things we have learned in body production for the armed forces.

Write or wire for complete information.



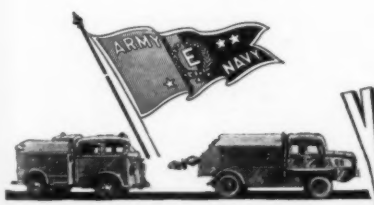
YORK-HOOVER MODEL 39 Compartment. Mounted in standard coupe for light service and installation work. Pull out drawers have adjustable partitions for small materials. Extension ladder carried on left side with tree trimmer and ground rod holder.

YORK-HOOVER MODEL 4013 AT. General service body for installation on ½ ton or ¾ chassis. Designed with telescoping roof which provides complete protection from weather or can be nested at front of body providing unlimited loading height.



YORK-HOOVER MODEL LCW-102 Light Line Body. Designed for 1¼ ton chassis. Write for detailed description of standard and optional equipment.

★ *Awarded for both quality and quantity production of war material.*



YORK-HOOVER CORPORATION

BODY DIVISION

YORK, PENNSYLVANIA

SMALL EXCHANGE STRUGGLE FOR SURVIVAL

By Norman M. Shenk

Peninsular Telephone Co.
Tampa, Fla.

A SMALL exchange owner has offered the comment that the principal underlying weakness of many of our smaller telephone companies is that the towns and areas they serve are simply not large enough to carry their telephone systems. Another small operator has provided a brief description of the extent and general characteristics of his community and then asked the question, "Does my town warrant a telephone exchange?" From these and other expressions and queries which indicate that a number of you are concerned along this line, it appears that we should toss this important subject of exchange and company size on the table and talk about it for a while today.

What is the situation here? Perhaps we first should establish just exactly what we have in mind when we speak of a town or community being able or not being able to support or carry a telephone system. There are two separate and distinct problems involved in this regard and some operators evidence a tendency to confuse them. The question of a community being able to support a *separate telephone exchange* must be recognized as an entirely different question from that of a community being able to support a *single exchange company* which is large enough to be operated economically and to provide gainful, full-time employment for an owner-manager. It has been my observation that the latter aspect is more likely to be the real consideration in a substantial portion of your situations.

Many telephone companies have found it practical to continue separate exchanges, and, under certain circumstances, even to establish new ones, in communities where there are as few as 40 or 50 subscribers to be served. A large number of units of this size (and some even smaller) are being operated by both large and small companies and many others will probably be established as our industry meets the challenge of further service expansion into rural areas in the postwar period.

PART III. The second installment in this series was published in the November 11 issue, page 13.

Experience has proved that very small exchanges can, in many instances, be made to fully pay their own way, but it has shown too, that the successful operation of such units is *largely dependent on the operating company having enough property to allow maximum efficiency in the use of manpower, material and work equipment.* It is here that many of you are sorely handicapped.

This writer shares the opinion held by many industry men who have given thought to small company problems *that one of the foremost tasks facing a great many single exchange owners is that of acquiring one or more additional exchanges, or of working out some plan with other small operators for the consolidation of their exchanges into more or less compact operating groups which are large enough to fully absorb the services of one man and the motor vehicle and work equipment he needs.*

Perhaps the best way to demonstrate the point under discussion is to take a successful small exchange operation and analyze it to see why it is successful. The case that comes to my mind is not necessarily either an average or a typical one, but it is an actual operation with which I happen to be familiar and it will serve to good advantage as an illustration. A few years ago an Independent company, *already operating a number of small exchanges,* agreed to establish a new one in a small but progressive town within its territory which had not previously had a telephone exchange, if a minimum of 50 subscribers could be secured in the town proper and its immediate environs. The town had a population of approximately 500 and the nearest telephone exchange was in a town of about twice that size located 14 miles distant. A fair exchange rate schedule was agreed upon and authorized, other arrangements were completed, and within a few months the company had installed a complete and modern telephone system. The entire plant—distribution system, station installations, a 50-line unattended dial switchboard and a small brick building to house it—represented an initial investment of approximately $8,500. The exchange was cut into service with only 54 subscribers.

The gross revenues of this new exchange (local service revenues and commissions on toll business) for the first two or three years were less than $2,500 per annum. It has now grown to some 90 subscribers and its gross annual revenues have increased to ap-

Low Cost Simplified Haulage..

over those "long, long, trails"

HIGHWAY TRAILERS...

★ The job of transporting cable reels and poles has been reduced to an easy method by utilities employing Highway Trailers.

For example, the pole trailer eliminates the necessity of a special truck with a bolster on the truck bed and permits the trailer with its load of poles to be hauled by trucks equipped with any type of line construction bodies. Loading a cable reel is quickly accomplished by tipping trailer back until saddles engage with spindle inserted through the center of the reel. The tongue is then pulled down and coupled to the truck.

In developing your post-war plans give thought to the haulage question for here is opportunity for you to save on special truck costs, on transportation time, and on loading and unloading time and effort. We will gladly send you a catalog that pictures and describes the various types of Highway Trailers.

ARMY E U.S. NAVY

HIGHWAY TRAILER COMPANY

MANUFACTURERS OF

TRUCK TRAILERS AND BODIES • EARTH BORING MACHINES • WINCHES • OTHER PUBLIC UTILITY EQUIPMENT

General Offices

EDGERTON, WIS., U. S. A.

proximately $3,800. Yet as small as it is, this exchange has carried its full expenses of operation—direct charges, depreciation, and its share of all accounting and supervision overheads—and has earned a favorable return on the capital invested in it from the beginning. Furthermore, because the plant is being well maintained and a reserve built up for replacements when necessary, the operation stands well to remain a successful one in the years ahead.

What conditions or practices account for the operation of this very small exchange being successful and profitable? The answer to that question will be found to include several elements, among them these important ones:

(1) An adequate schedule of local service rates was secured. Gross revenues (including toll commissions) have averaged around $46 per subscriber per annum.

(2) A sound and well-constructed plant offers first class service to attract and hold customers and to foster toll usage. This has been an important factor in the exchange's growth.

(3) An unattended dial switchboard eliminates the need for operators and keeps traffic expenses at the minimum, necessary to cover the handling of service calls at the control exchange.

(4) No plant man is stationed at the exchange. Installations and maintenance are handled by forces from a nearby point and the exchange is charged only for the actual time and expense of men and equipment used in its operations. Total maintenance expense, including materials, has averaged less than $50 monthly.

(5) The exchange is required to pay only its pro rata share of overhead expenses and as a result it receives engineering, accounting, billing, commercial and management services for a sum which has averaged only about $30 monthly.

While each of the several conditions outlined above is contributing to the successful operation of the exchange, it is the fourth and fifth items named which lend particular emphasis to the point we have under discussion—the fact that the company's total expense for maintaining and managing the exchange (and doing both well) is averaging *less than $1,000 a year.*

There is no reason why a small exchange operator cannot do the same job as a larger company with an exchange of this size *if he is able to employ the same operating economies.* But, it is clear on the face of it that no individual operator could reasonably expect to make a successful business which would provide him with full-time employment out of a *single exchange property* of this size. Neither would an individual with that as his objective be wise to risk the expenditure required to construct or rehabilitate such a plant. When the costs of carrying

(Courtesy, COLLIER'S)

"Here is your spirit! Please limit your talk to five minutes. Others are waiting."

the investment and providing for depreciation are added to the ordinary day-to-day expenses for material and supplies, truck operation, rent, heat, electric power, taxes and all of the other necessary items, the remainder simply could not provide a satisfactory wage for the owner-manager. If the operator *did* pay himself a reasonable wage from his receipts, he would be obliged to do so at the expense of his plant and the service to the public.

Just how large, then, must a property be to offer possibilities for successful operation as a *"one-man" company?* Here we have one of those questions for which, due to the several variables involved, there is no hard and fast answer. For example, the individual who is able to perform all of his own plant work does not, of course, need as large a business to carry his basic expenses as the one who must employ a maintenance man. On the other hand, *a property which is predominantly rural is usually much more costly to operate and hence may need to be larger than one which has a normal distribution between rural and urban users.* Likewise, a group of two or three exchanges, however compactly located, obviously requires a larger investment and are more expensive to operate than a single exchange with the same total number of subscribers.

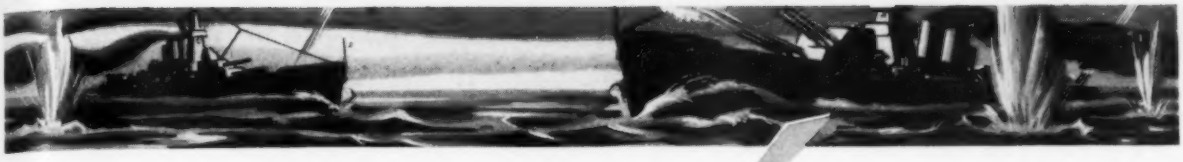
Without disregard for the hazards of generalizing on a subject pertaining to a great many separate properties faced with the variety of conditions to be found in different parts of the country, I would venture the opinion that, under average circumstances, about 150 to 200 subscribers is the minimum number *which can be expected to sustain an owner-manager operation.* It goes without saying that a larger property would naturally be desirable from several viewpoints. However, if the communities which the exchanges are serving are normal ones with some stabilizing elements, a property having 150 to 200 subscribers should have a gross revenue potential, with fair rates and a normal volume of toll traffic, of from $6,000 to $10,000 per annum. If income of that amount could be developed, a property should be capable of supporting an individual operator who can do his own work and at the same time offer reasonable security for the investment in plant.

A majority of the small companies which are in serious condition, financially and otherwise, today, *are below the minimum size classification we have just discussed.* In fact, a review of industry statistical records discloses that there are more than 3,000 single exchange companies serving less than 150 subscribers each and that nearly half of those 3,000 have less than 100 subscribers each. It is difficult to believe that most of the communities in which the latter exchanges are located are sufficiently substantial to support single exchange companies at any rate levels which regulatory commissions would see fit to authorize.

Even though small, these towns are, for the most part, established trading centers serving established trade areas and have a definite need for telephone service. Many probably have some industrial or perhaps county government activities in addition. However, it is equally difficult to avoid the conclusion that few, if any, of these 3,000 small exchanges, even if the most favorable plant and rate conditions were accomplished, offer attractive possibilities for operation as *single-unit, owner-manager properties.*

A fundamental requirement for success in any business is volume in excess of the minimum necessary to carry fixed charges and overheads. A merchant may be able to make a good profit on each item of merchandise he sells, but unless he has enough volume to carry his expenses and provide him with an income in return for his time, his enterprise will fail. This same broad principle applies to the telephone business and is one which should be kept in mind by small operators who are seeking solutions to their problems.

The foregoing discussion is made with the thought of suggesting that one solution to the small company problem might be for owners of single exchange properties, too small to sustain an owner-manager operation, to work out plans with neighboring small exchange owners for the purchase or consolidation of their exchanges, resulting in the organization of compact two, three or four-exchange operating groups, thereby bringing about the installation of modern equipment, improved service and joint use of personnel, motor vehicles and work equipment.



"They filled a gap—"

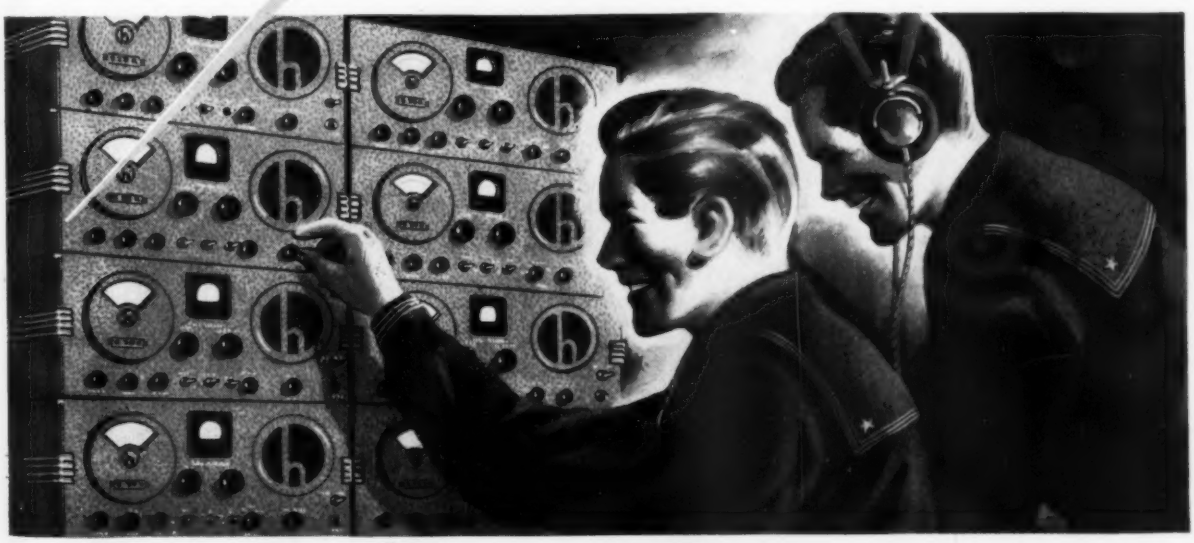
• The following is quoted from a letter received from a Chief Radio Mechanic in the U. S. Navy and is one of a series of real life stories of Hallicrafters radio equipment in action . . .

"During the early days of the South Pacific offensive the cruiser on which I was serving was called upon unexpectedly to maintain a watch on five extra frequencies. All of our regular receivers were already in use and it was impossible to use any of them for this emergency.

"Some thoughtful predecessor in peace time had purchased eight Hallicrafters S-20-R receivers with ship's service funds for use as broadcast receivers in the crew's quarters. We dug them out of the lockers and tested them. All were in excellent condition after months of vibration, humidity and tropical heat. We stacked them on an operating table in the radio room and set them on the specified frequencies.

"The first call on all frequencies was heard S-5 and voice signals came through clear as a bell. These receivers required no attention other than volume adjustment and the volume was sufficient to over-ride the noise of guns on our own ship. Their reliability in a tough spot amazed us. They filled in a big gap in the chain of command and filled it well."

The S-20-R mentioned above is known to thousands as Hallicrafters famous "Sky Champion." It has a frequency range of 550 kc. to 43 mc., continuous in 4 bands and 9 tubes.



BUY A WAR BOND TODAY!

hallicrafters RADIO

THE HALLICRAFTERS COMPANY, MANUFACTURERS OF RADIO AND ELECTRONIC EQUIPMENT, CHICAGO 16, U.S.A.

ANNUAL CONVENTION HELD

By South Carolinians

THE South Carolina Independent telephone men and women gathered in Sumter, November 16 and 17 to hold one of the best annual meetings ever conducted by the South Carolina Independent Telephone Association. The South Carolina Continental Telephone Co., Sumter, acted as host to the convention. November 16 was given over to registration and to a meeting of the board of directors; the business sessions of the convention were held November 17.

On the evening of November 16, a barbecue supper was given to the men attending the convention, and the women attended a dinner, both of which were sponsored by manufacturers' representatives.

The following officers were elected: President, S. L. Bell, Chester; vice president, S. B. Green, Sumter, and secretary-treasurer, L. W. Allen, Sumter. The following were elected directors: Mr. Bell; T. C. Thomasson, Lancaster; E. T. Campbell, Georgetown, and H. W. Askins, Chesnee. Other members of the board of directors are: F. S. Barnes, Rock Hill; C. B. Barksdale, Greenwood; A. O. Bolen, Swansea; S. B. George, Lexington, and Mr. Green.

The convention was welcomed to Sumter by J. A. Raffield, Sumter city manager.

Retiring President Thomasson presented his annual address and reported the association activities during his administration. Mr. Thomasson cited the slogan, "devotion to duty as a telephone tradition" and stressed the need for telephone companies' rendering dependable service to the public and for extending service to more rural districts.

"The public has been kind and patient," he said, "but it expects and has a right to expect more and better service. Service is all we have to sell so we should make it the kind and quality of which we can be proud."

W. D. Wilkinson, Greenwood, retiring secretary-treasurer, in his annual report stated that the association membership had increased and that the organization is in good financial condition.

John P. Boylan, Rochester, N. Y., president, United States Independent Telephone Association, addressed the convention on "National Affairs."

Mr. Boylan stated that the long-time outlook in the telephone industry is bright and that under sound management the industry will continue to expand as it has in the past. He stated that the industry will have to continually improve telephone service and that it keep pace with economic progress, educating the public accordingly.

Concerning the expansion of government industrial and economic develop-

J. A. RAFFIELD, Sumter city manager, welcomes the South Carolina convention. Seated, left to right, are: T. CARTER THOMASSON, retiring association president; JOHN P. BOYLAN, Rochester, N. Y., president, United States Independent Telephone Association, and W. D. WILKINSON, retiring secretary-treasurer of the association.

Registering at the South Carolina convention are FRANK S. BARNES (left), Rock Hill, S. C., and H. O. LEINARD, Cleveland, Ohio. In charge of the desk are, left to right: MRS. ELIZABETH THOMAS McELVEEN, BLANCHE TIMMONS and MRS. VIRGINIA AYCOCK, all of the Sumter staff of the South Carolina Continental Telephone Co.

FOR LASTING, DEPENDABLE SERVICE...

rely on these 6 advantages of Transite Ducts

Inorganic . . . made of an asbestos and cement composition compressed under great pressure. This provides permanence and strength. These ducts are also immune to rust and rot.

Permanently smooth bore . . . long cable pulls and replacements are made easier. Danger of damage to cables is minimized.

Easily and quickly installed . . . long, light-weight lengths and simple assembly method assure rapid, economical installation.

Immune to electrolysis . . . being entirely inorganic and non-metallic, these ducts are not affected by electrolysis or galvanic action.

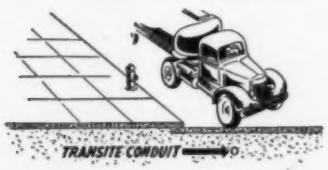
Lower cable temperatures . . . an advantage resulting from a relatively high rate of heat dissipation.

Incombustible . . . won't contribute to the formation of dangerous smoke, gases, or fumes. If burnouts do occur, these inorganic ducts provide maximum protection to adjacent cables and permit easy removal of damaged conductor.

For complete details on Transite Ducts, write for Data Book, DS-410, Johns-Manville, 22 East 40th Street, New York 16, N. Y.

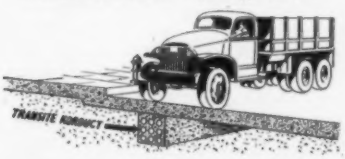
JOHNS-MANVILLE *TRANSITE DUCTS*

TRANSITE *CONDUIT*



Designed for exposed work and for use underground without a concrete encasement.

TRANSITE *KORDUCT*



For use in concrete. Thinner walled, otherwise identical with Transite Conduit.

In this threesome photographed at the South Carolina convention are, left to right: J. A. RAFFIELD, Sumter city manager; T. CARTER THOMASSON, Lancaster, retiring association president, and W. D. WILKINSON, Greenwood, retiring association secretary-treasurer.

ment, Mr. Boylan said the danger to private enterprise was no more from this source than from all sides in general, stating that comprehensive telephone operation still would depend on giving attractive service at a cost within the reach of consumers.

Prior to the afternoon business session, the convention toured Shaw Field, one of the largest and most outstanding Army air fields in the country. After the return from the visit to the field, H. M. Stewart, Fort Wayne, Ind., vice president, Telephone Services, Inc., addressed the group on "Looking Ahead in Our Industry." Mr. Stewart stressed the necessity of preserving good relations with subscribers and the individual responsibility of every telephone employe in the telephone industry's effort to give efficient telephone service to the public.

Following Mr. Stewart's address, the convention divided into two groups—a traffic conference and a commercial and plant conference. Mr. Stewart addressed the traffic conference, while L. W. Hill, Tarboro, N. C., vice president, Carolina Telephone & Telegraph Co., addressed the commercial and plant session on "Small Exchange and Rural Telephone Development." In his address, Mr. Hill cited specific instances of the work that has been done by his company in supplying dial service to small communities. (TELEPHONY, April 15, page 9.)

The convention adjourned with the holding of these two conferences.

Signalmen in Normandy Keep Messages Flowing

Many stories of U. S. Army Signal Corps men in Normandy have now seeped in to the home front. Prominent in the picture are infantry wire patrol crews and airborne Signalmen.

One of the earliest stories, in point of time, is that of a patrol crew of 11 enlisted men led by Lieut. Paul J. O'Reilly of Brooklyn, N. Y. The crew landed on a Normandy beach in the first stages of the invasion and immediately, in the face of enemy fire, set up inter-communications lines, tying together the various invasion units in that area. As fast as the enemy knocked out the lines they jumped in and repaired them.

As the invasion Army grew in strength and covered more of Normandy, the wire network grew to fantastic proportions. Hundreds of local lines ran along every country lane, crisscrossing every orchard and barley field. All telephone wires were checked four times a day by troubleshooters, using portable Signal Corps telephones. So efficient was this service that the troubleshooters could inform the wire patrol crews of the exact point—that is, between two stated poles — where any break occurred. Then, in a matter of only a few minutes, a lineman would be at the spot to fix the break. French cement poles, usually placed much too close to the road to permit easy passage of large Army vehicles, had to be used at first, but gradually these were replaced by larger wooden poles, shipped from American lumber yards. Small "rapid" pole lines were erected at intervals between the larger poles, to take up the slack of the innumerable dangling wires so that they would not be broken by passing trucks, especially in wet weather when the trucks tend to slip badly on the mud of country roads.

Enemy strafers were all a part of the day's run, said Lieut. Edward H. Collins, Jr., Livingston, N. J., reporting in an almost casual vein, "An enemy fighter shot the rear tires from under one of our jeeps, but luckily none of the men were injured." The patrol car kept on the job, with only the delay necessitated by putting on a couple of new tires.

The airborne Signal Corps men, landing in Normandy by parachute and glider, were as active as the wire patrol crews of the infantry. Signalmen of the 82nd Airborne Division, for instance, are reported to have gone to work in the early hours of D-day from the very moment they "dropped in" on France. Veterans of the Sicilian and Italian campaigns, they knew from grim experience how to lay wire, repair radios, deliver messages and supply necessary signal equipment in the face of almost continuous enemy fire. As one of their activities they laid 3,000 miles of wire, and as another they repaired 85 radios, returning them in fit condition to operating units.

LEND OVER HERE TILL IT'S OVER OVER THERE

Buy War Bonds

CONDUIT BRIDGE CROSSING: When using underground conduit construction for telephone cable distribution it is often necessary to make bridge crossings over small streams or ravines. Formerly it was considered necessary to use iron pipe for attaching to the bridge. When the conduit cannot be enclosed in the paved roadway, the above photograph shows one approved method for the use of cement-asbestos conduit. It will be noted that this conduit is attached direct to the bridge structure to avoid the use of iron pipe.

Quality fights, too, brother!

TODAY conservation of materials is the order of the times. This is one good reason why the smart buyer is a quality buyer. He knows that quality items last longer and that replacement operations are reduced—a highly desirable factor when the manpower situation is so acute.

And this is why you will find more independent telephone companies buying "Eveready" "Columbia" "Gray Label" telephone cells than any other brand. These batteries are famous for long-life, a high level of uniformity and sustained voltage. And they should be, for they are made under the rigid specifications of the world's largest dry cell laboratory.

★ UNIFORM QUALITY

★ LONGER LIFE

★ SUSTAINED VOLTAGE

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation

UCC

General Offices: 30 East 42nd Street, New York 17, N. Y.

Division Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

The trade-marks "Eveready" "Columbia" and "Gray Label" distinguish products of National Carbon Company, Inc.

Taxation Without Realization

By FRANCIS X. WELCH

Many persons, particularly the customers of public utility companies, are the unwitting victims of this painless political and therefore popular method of obtaining money for federal, state, and local treasuries. Reprinted from "Public Utilities Fortnightly."

TAXATION can be an intriguing subject, provided, of course, you don't have to pay the taxes studied. The history of taxation, which is as old as the recorded history of mankind, demonstrates by the very variety of taxation the ingenuity of the political mind. From the biblical tax on salt, to the British tax on tea, which marked the American Revolution, about every article that man eats, wears, or uses for business or play, has at one time or another been subjected to some form of special taxation.

Among the odd taxes noted: The special taxes on visitors and street facades in Belgium; on musical instruments and domestic servants in France; the ancient light tax (per window of the house) in England, the tax on bachelors in China (which Mussolini imitated indirectly by subsidizing married men with large families out of general tax funds). Virtually all forms of recreation have been taxed. All forms of domestic animals have been taxed, including horses, cattle, sheep, dogs, cats, and—yes—even rats (the latter in Egypt where the idea was to discourage the existence of the disease-carrying rodents).

Now, while it is doubtless true, as Benjamin Franklin observed, that "there is nothing sure except death and taxes," at least death has no encore. Neither does it get worse every time Congress meets or the legislature is in session. The upward spiral of taxes, on the other hand, in violation of the law of gravitation, is a continuous and expanding performance.

The need for increasing government revenue drives the alert tax official to the site of the last sign of financial prosperity, as surely as the keen scent of the desert coyote is attracted to the smallest green bush nourished by the tiniest stream of water. Scientists may boast that the horizon of invention is unlimited; but we can depend upon it, no matter how fast science moves it can never outstrip the tax collector. He is figuratively sitting on the laboratory doorstep waiting for new things to be invented so he can tax them. Indeed, it is reported that once upon a time while Faraday, the great English physicist, was explaining to Prime Minister Gladstone certain experiments with gas, he was asked by Gladstone "Of what use is it?" He replied with exasperation, "It will probably be something you can tax, sir!"

It was not until the indirect tax came into vogue, however, that the tax collector really found ways and means for an unlimited drainage system. What is an indirect tax? A school boy, once asked to give an example of the indirect tax, said: "The dog tax, because the dog doesn't have to pay it." That is technically correct. The dog's owner has to pay it, of course. But he is *aware* of it. He is generally glad to put up the necessary couple of bucks, or whatever it is, to keep good old Fido sniffing around the premises.

But there are a lot of public officials today who would be pretty deep in the dog-house if the taxpayer were only wise to the clever little tax game which state and local governments are playing every year for increasing amounts. In this game, the unsuspecting citizen pays taxes piled on top of taxes. But he is never, or rarely ever, aware of it. The reason is, simply, because the tax is charged to and paid by somebody else.

This isn't just another article about ordinary run-of-the-mill indirect taxes. That was the old-fashioned politician's idea of painless extraction of the taxpayer's dollar. But it's old stuff today. Taxpayers are getting smarter. Thanks to publicity in the newspapers, magazines, through advertisement and discussion on the radio, the average bright newsboy knows, for example, that the government gets more money in taxes on the purchase of a package of cigarettes, than the cigarette manufacturer does. It is pretty well known that the same is true in the purchase of a bottle of liquor, cosmetics, and other so-called luxury or semi-luxury items. Aside from being quite necessary in these days of tremendous government expense, such indirect but poorly concealed taxes are now taken as a matter of course.

No, it is the *concealed*, indirect tax which is the modern political tax siphon and a pocketbook cancer for just about every solvent soul in America. This tax is especially insidious because the American public, by and large, is composed of good sports and patriotic citizens. They shell out cheerfully and without complaint because they feel that the government needs every tax dollar desperately. Yet, it is precisely because of this obvious need—particularly the need of the Federal government to defray war expenditures—that petty rackets practiced by state and local tax authorities in the form of concealed, indirect taxes are all the more reprehensible.

These camouflaged local nuisances bleed the body politic unnecessarily, at

Photograph Courtesy Western Electric Company

The essential time data required for charging long distance calls are provided immediately in printed form when Calculagraphs are used.

These instruments combine time saving with accuracy, dependability and simplicity of operation. Whether used in large or small central offices they facilitate the handling of toll traffic.

CALCULAGRAPHS are used by telephone systems throughout the world to help handle the prevailing heavy volume long distance traffic.

CALCULAGRAPH COMPANY

INCORPORATED 1892

310 SUSSEX STREET • HARRISON, NEW JERSEY

the very time when every drop of financial plasma is necessary to pep up the national credit in a critical war struggle. The concealed indirect tax is a discriminatory bloodsucker which can only thrive in the darkness. If once dragged into the open sunlight where all the people could recognize it for what it is, it would expire ignominiously.

Give an example? Let us first take a simple analogy. Suppose that, instead of billing you as the owner of Fido for his dog tax, the city billed your neighbor across the street or your lawyer or doctor, or your electric company. Suppose, however, that the fee was paid by you, just the same, hidden within a general bill for some professional or public utility service performed. You would probably think that was a silly way of billing. You might also just shrug your shoulders and conclude that, in any event, you had finally paid Fido's fee yourself.

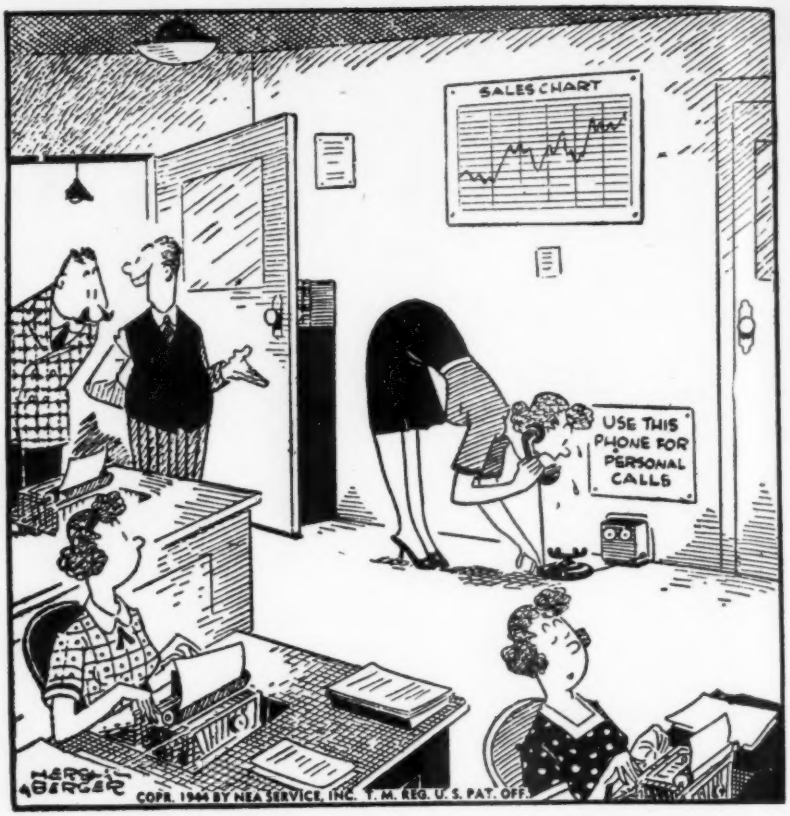
But, suppose on top of that, the city sent you a second bill! You would probably burn right up, if you knew about it. If you did not know about it, you would pay both bills cheerfully. You would not realize that Fido was really a double feature on your tax program.

That, folks, is the concealed indirect tax. That is exactly what is happening in New York State today where taxation of the public through their utility bills has reached an absurd limit, especially with respect to their telephone bill. *Out of every dollar paid by the average New York State subscriber for telephone service, 32 cents went for taxes — 10 cents plainly marked as such—while the remaining 22 cents were for concealed indirect taxes charged to the company.*

It's happening elsewhere, too. Politicians have long realized that utilities are ideal tax-collecting agencies. The average hard-pressed citizen may stall around, think twice, delay, or temporize over paying the butcher, or the dentist. But he knows that when he does not put the dough on the line for gas, electric, and telephone service, that line is going to go dead in short order.

What better way, then, to make the unsuspecting public cough up some extra taxes—taxes over which the public might go into a rebellious rage, if it knew it were paying them? The idea is simply to sneak such taxes into the telephone, gas, and electric bills, and let the utility company pass them on. Then, if there is any squawk, the utility company will have to take the rap.

This trick comes easily to the politician. Public utilities have been his whipping boys so long that the average voter is likely to think it is all part of the same old song and dance which has been going on ever since good old William Jennings Bryan discovered the wicked "vested interests," in the gay nineties.



(Courtesy, NEA SERVICE, INC.)

"Personal calls have been cut in half since we had the telephone installed there and the cord shortened!"

Chances are, the taxpaying victim, doubling in the rôle of utility ratepayer, actually thinks it is the utility company which is paying the tax out of its own corporate pocketbook. Like as not, he will get a little tingle of satisfaction, saying to himself "Well, the telephone company is better able to pay it than I am." *And all the time the poor misguided creature is paying the tax himself.*

In other words, our bemused citizen is like a village yokel who thinks he is snickering at a carnival slicker picking a stranger's pockets; whereas, actually, he is looking at himself in a trick mirror and laughing at his own expense. It's Taxation without Realization—the smoothest, sweetest, political racket since modern public utility regulation by state commissions broke up the good old franchise hold-up game.

What happens is simply this: The public utility company, not being in business for the fun of it, merely totals up all of its operating expenses, *including taxes which it pays,* and charges rates sufficient to cover everything. "Everything" includes, of course, an over-all profit for the utility limited by the state commission. Unfortunately, the public utility commission has no authority to limit the taxes. It can only protest futilely (as the New York Public Service Commission has done) that higher taxes on utilities inevitably mean high rates for the consuming public. To date nobody in Albany or other state capitals seems to be worried much about such protests.

It's not the average citizen's fault if he's confused. Even the simpler form of modern taxation comes wrapped in double-talk likely, if not calculated, to confuse the smartest of us. But when the Mickey is slipped into the poor citizen's tax mixture, accompanied by an assurance that it's really a medicine mixed up for the bloated bondholder crowd down the street, who needs it badly, that is—well—Taxation without Realization.

And, by the way, have you looked at your own utility bills lately? Take, for example, your current telephone bill. Let's say you live in a fair-sized city in New York State and this month's bill for single-party, unlimited, resi-

RAYTHEON TELEPHONY EQUIPMENT

Eliminates Power Supply Headaches in Rural Exchanges

Entirely automatic in operation, Raytheon telephone equipment has no moving or expendable parts . . . nothing that requires frequent adjustment or maintenance. Simply plug 'em in — and forget 'em . . . because from then on Raytheon RectiChargeRs or RectiFilteRs take care of your power supply demands.

RectiFilteR With Cover Removed

RECTIFILTERS

(battery eliminators)

- Eliminate batteries and the expense of routine service.
- Release charging cable pairs, at remote locations, for revenue producing service.
- Provide stabilized DC output voltage from no load to full load.
- Minimize power costs because of high efficiency in converting AC to DC.
- Save $30 to $90 a year.
- Wide range of models for varied operations . . . 50 or 60 cycles.

RectiChargeR With Cover Open

RECTICHARGERS

A Raytheon RectiChargeR and batteries provide an automatic AC-DC power system. RectiChargeRs —

- Keep batteries fully charged.
- Prevent overcharge and undercharge.
- Eliminate voltage variations.
- Increase battery life as much as 40%.
- Reduce battery maintenance and inspection to once or twice yearly.
- Complete range of units —11/12 & 22/24 cells . . . 1 to 12 amps . . . many models for 50 cycles input.

The coveted Army-Navy "E", for Excellence in the manufacture of war equipment and tubes, flies over all four Raytheon plants where 12,000 men and women are producing for VICTORY.

RAYTHEON
MANUFACTURING COMPANY
190 WILLOW STREET, WALTHAM, MASS.

MANUFACTURERS OF VOLTAGE STABILIZERS, RECEIVING AND TRANSMITTING TUBES AND COMPLETE ELECTRONIC EQUIPMENT

dential service comes to $4.85. This does not include extra charges for long distance calls (which carry a federal tax of 25 per cent all by themselves, but that's another story).

All right. Let's dissect that $4.85. Right off the bat, the bill tells you that 15 per cent of the total (which amounts to 70 cents) is a tax on the monthly bill for local exchange service. That is a federal tax, levied to help pay the cost of the war. It's pretty stiff as special taxes go. But Uncle Sam is a fairly honest old gentleman. At least, he tells you about it right out in black and white. It is segregated on the face of your bill so that you know what's what and who's paying how much to whom.

(Uncle Sam isn't quite so frank about another little item of a 3 per cent excise tax which he has been slipping into your monthly electric light bill since way back in the early 30's. But let's keep on with our New York telephone bill.)

The balance of $4.12 which you ostensibly pay over to the telephone company is next tapped by the state of New York to the tune of 2 per cent on the company's gross earnings. The municipality takes another 1 per cent — leaving a balance of $3.99. Some idea of the amount this tax yields the state can be gained from the following excerpts from Governor Lehman's message to the legislature on April 12, 1937:

"I recommend that the legislature make an additional appropriation of $24,000,000 for unemployment relief. This money can be raised by the imposition, commencing July 1, 1937, of a tax of 2 per cent on the gross receipts of companies furnishing utility services in the state."

Add to that the additional 1 per cent levied by municipalities on local utilities, and the total "take" figures out at nearly $3.00 a year for every man, woman, and child in the state. And for what? At first, it was for "unemployment relief." Just why the citizen's utility bill should be made the vehicle for carrying the lion's share of the public relief burden was never made clear. But it was generally understood that there would be less publicity, and less argument about it if it were done that way. If a direct tax to support an appropriation for that purpose was levied on the general public, the public would ask too many questions. Hence the recourse to Taxation without Realization.

Since 1937, unemployment has been replaced by labor shortage in New York and elsewhere. Was the tax thereupon taken off? It was not! The same old taxes go on and on.

The 1937 bill specifically provided that the utilities had to "absorb" this tax, meaning that they should not pass it on to their customers. But that was merely a cover-up to kid the public. In effect, that merely prevents the utilities from marking the tax off on their bills, so the customers recognize it. The tax is still an "operating expense," and utilities are still allowed under law to charge rates sufficient to cover all costs of operation, plus a reasonable return on their investment. When the New York utilities applied for rate increases to take care of these extra taxes, the regulatory authorities granted them.

The telephone being used by BERNICE WILLIAMS, Peninsular Telephone Co., Tampa, Fla., is one sent from Italy by an American service man to his wife who lives in Tampa. After the service man had received a letter from his wife, stating the difficulty she was having in obtaining a telephone, he sent the instrument shown, saying perhaps it might help relieve the shortage. (TELEPHONY, November 11, page 35.)

Since unemployment disappeared, New York State and cities have been collecting this tax for "debt retirement and other financial matters." New York City, for example, cannot operate its own public utility business — the subways—profitably. The tubes go into the red every year. This means that the city is taxing its privately owned utilities (which operate in the black) in order to subsidize, in part, the deficits run up by its own tax-exempt and tax-eating enterprise.

Publicly owned and operated utilities, of course, in New York and elsewhere are notorious tax dodgers. They are either entirely exempt, or pay but a small token of comparable federal, state, and local taxes which privately owned and operated utilities must pay. The politician doesn't even try to justify this discrimination, any more. But it means that citizens of New York, Chicago, and other places where utility service is a private enterprise must bear, through rates, an unfair share of the tax burden which the citizens of Los Angeles and Seattle escape, because of government utility operation in those communities.

But we have not finished yet with our telephone bill. In truth, the most absurd cut of all has been saved until last. It is simply this: *Do you know telephone companies in New York cities have to pay a real estate tax on the telephone instrument located in the homes of their subscribers or in their places of business?* Granted it sounds crazy, in view of the fact that the subscriber (or his landlord, if he rents or leases) is already paying real estate taxes on such premises. That's the law.

Just how much this extra tax amounts to on our hypothetical telephone bill would be difficult to figure out, because local assessments and rates vary in different communities. But in the city of Syracuse alone, the extra assessed valuation for this tax, sustained by the state courts, on telephones, bell boxes, lead in wires, and other items located on the subscriber's premises, *amounted to $700,000*—a sizable stack of chips in any league. Subtracting the per customer share of this tax might conceivably cut our total telephone bill down to $3.50—out of the original $4.85 which you pay through the cashier's window of your telephone company.

You may well wonder just how this real estate tax on items located on somebody else's property can be justified. Take a look at your telephone. Does it look like real estate? (Even if it did, of course, remember you are *already* paying real estate taxes on your premises.) Lift it up. It weighs maybe three pounds. It is connected with a small, light bell box (four pounds), attached to the house with a couple of screws. A light stapled wire runs out to the drop wire connection. That's all there is to it.

If that's real estate, so's your wife's curling iron. So is your mechanical refrigerator which is bigger, heavier, and more firmly affixed to the realty. So is your radio, vacuum cleaner, electric iron, and other appliances. So are the gas, electric, and water meters owned by other utility companies. But the law says none of these things is real estate. The law does not even say the telephone instrument is real estate—in so many words. The law merely says that the telephone is subject to a real estate tax—or so the courts have held —in construing an old 1881 tax statute, which no member of the legislature in his right mind ever intended should have such a construction.

In this case, it must be conceded that

the legislature was a bit careless with its language when it said that "all telegraph lines, wires, poles, and appurtenances" should be classified as taxable real estate. It was obviously trying to make sure that telegraph and, subsequently, telephone companies were taxed on the equipment affixed to their own realty. This was, doubtless, because such pole lines constitute an extra property value, and in some places a traffic hazard, over and above the ground on which they stand. And, although there is no record that a telephone pole ever struck a motorist except in self-defense, telephone companies generally have never contested the real estate tax on such a basis.

The basis, of course, is the old common-law theory that property permanently affixed to the realty becomes part thereof. Thus, if you build a house on your neighbor's land, he gets the title—and the tax bill. But the way the city politicians (backed by the New York courts) have twisted this theory in construing the word "appurtenances," must make Blackstone spin around in his grave like a pinwheel.

It seems that city taxing authorities, always alert for just such an opening, first seized on "appurtenances" to include switchboards, even those located on leased or rented premises. Well, a switchboard is a pretty heavy piece of furniture in most telephone company exchanges. You can't move it as easily as the grand piano, when the wife decides to change things around the living room. So the courts O.K.'d the tax on switchboards.

This got the politician off on another line of thought. How about the wires leading *from* the switchboards? They followed the lines out into the streets, down under the streets, onto the customer's premises, and right into his very house. Result: A real estate tax on your telephone instrument! The courts, having been pushed that far along by their own precedent, went the rest of the way. The decision was a curiosity piece. The justices solemnly held that even though a telephone set itself is not real estate, it is, nevertheless, subject to a real estate tax. Why? Because it is connected by a wire, which may run several miles, to the central station of the telephone company!

In order to arrive at this conclusion, it was necessary for the New York Court of Appeals to avoid overruling itself by drawing a distinction so fine a good many lawyers still can't see it with high-powered glasses. The court distinguished between *electric* wires, meters, etc., on the customer's premises and *telephone* wires and instruments, because an earlier decision had ruled that electric facilities are not subject to real estate tax. By similar reasoning you might be taxed for fixtures on your neighbor's garage, merely because the maid has strung a clothes line across your back yard to a pole attached to the garage roof.

It has never been suggested that public utilities should be let off for one cent of real estate, personal property, franchise, or other taxes which they pay—and they pay plenty. The New York Telephone Co., alone, in 1943 paid $61,900,000 in various taxes, an increase of $8,900,000, or about 17 per cent increase over the preceding year. *These taxes averaged $20.73 per year for each telephone instrument in service.* In addition, the company turned over to various taxing authorities some $30,000,000 in taxes on toll messages and other special levies.

It is only when the utility is used as a front for concealed taxation that the citizen has a real complaint. Public utility men have grown so used to being made the goat for politicians trying to dodge their true responsibility for justifying and collecting taxes that many of them don't put up any argument about these tactics. Some utility men even wonder if the role of tax collector will not eventually give them a sort of immunity from the threat of eventual public ownership. The reasoning along that line is that private utilities will become such valuable tax collectors that the politicians could not get along without them — which they would have to do if public ownership took over.

But most utility executives and employes, who have a real pride in the fine tradition of American public service, resent this parasitic growth of taxation which chokes the full and abundant use of utility service by the public. They scorn the role of Publican, with its mean security, content to live on the crumbs which politicians allow to be kept out of the enforced collections from an unsuspecting public. It was not for this, they reason, that the inventive genuis of Thomas Alva Edison, Alexander Graham Bell, and others labored to bring forth the modern miracles of utility service. The utility "career" people look forward to a postwar expansion in their business, which will bring more and better service at cheaper rates to an ever-increasing number of customers.

Some of these public utilities have actually managed to absorb these tax levies by sacrifices at the expense of the investor, which isn't a fair thing either. At best, this means that possible rate reductions are being withheld from the public. It is not generally realized perhaps that with the price of just about everything else going up since the war began, including taxes, wages, and prices of materials which utility companies themselves must pay, rates for public utility service have not increased and that in some instances they have actually gone down since Pearl Harbor. And you don't need any ration books, either, for utility service.

State and city tax officials are naturally going to fight any move to correct such tax inequities and to prevent the public from waking up. They know that any move in this direction would probably mean that certain fat characters in city hall, who have been riding comfortably on a gravy train, will have to get off and go to work for a living. They don't like to let go of such a sweet thing. City hall politicians have been notoriously successful in passing the hat and keeping a tight hold of the proceeds. They stick together pretty well too, whether it's a case of going down to Washington with smoked glasses and a tin cup begging for a handout from the federal government, or sending up a propaganda smoke screen about the "vested interests" and Wall Street "trusts" to keep the public eye off the tax ball.

Most people, for example, think of the telephone business as the financially powerful Bell System. It is not generally realized that 49 per cent of the communities in New York State are served by little Independent telephone companies, for the most part owned and operated by local people. Such statistics as are available for the year 1942 show that out of 106 of the 156 Independent telephone companies, 69 of these companies paid no dividends, while the earnings of 27 of them were actually in the red. Needless to say, the end of this route is a collapse of service unless some relief is forthcoming.

Fortunately, there is some evidence that the people are waking up. When they do, there are going to be some changes made around the state capitals of the nation. In short, when the people realize what a job has been done on them, they are going to reach for a ball bat. Smart legislators will be among the first to scourge the parasites out of the state capitals and city halls by writing or rewriting tax legislation that will put the tax responsibility where it belongs. An indignant and awakened public opinion is going to make itself heard and felt. You can't keep from all of the people, all of the time, the plain truth that if "taxation without representation is tyranny," taxation without realization is legalized larceny.

Buy War Bonds

ADVERTISEMENT

STATEMENT

by

Gary Services and Investment Company

relative the

United States Independent Telephone Association

This statement is made by Gary Services and Investment Company, the service company for the Gary Group, on behalf of the companies of the Gary Group (with operating telephone companies in seventeen states) that are members of the United States Independent Telephone Association.

Widespread newspaper and other publicity was given out in New York on November 20th to the effect that the Association had joined with the Bell System in a number of "Joint Committees" for dealing with farm telephone matters.

This action, unprecedented on the part of the Association, was taken on the Association's behalf by two or three members presumably representing the Association's Farm Telephone Service Committee (which has five members) without the prior knowledge or approval of the Association's Board or Executive Committee or the formal affirmative vote at a duly convened meeting of the Association's Farm Telephone Service Committee. Three members of the Farm Committee were present. One of them, a member of our organization, protested against the action.

We favor at all times strict adherence to procedures that are in conformity with the Articles of Association and By-Laws of the United States Independent Telephone Association.

Participation by the Association in "Joint Committees" with the Bell System is in contravention of the Association's Articles of Incorporation and By-Laws, which do not permit committees dealing with the Association's affairs to have Bell membership.

The Gary Group is opposed to this method of carrying on the Association's business and believes that the effect of the announcement that the Association and the Bell System have joined together in committees will be injurious to the Independent telephone industry. We also believe that such an action on a policy matter of major importance is not within the province of any Committee but belongs exclusively to the Board of Directors.

For many years the United States Independent Telephone Association has represented solely the interests of the Independ-

ent telephone industry. It has accomplished many things beneficial to Independent telephone companies. It has been able to do that, however, because it has been free to represent Independent interests, and those alone, and in the manner it considered best for Independent telephony.

Independent and Bell interests are frequently mutual. When that is the case we favor cooperation between the Association and the Bell System, provided such cooperation is carried on openly and is within the purpose and By-Laws of the Association and in such manner as to leave the Association free to reach its objectives in its own way. We have long favored cooperation in this manner and for more than thirty years we have publicly participated in it when the interests of the two groups were mutual.

Such cooperation on matters in which the interests of the two groups were mutual has been successfully carried on many times in the past without "Joint Committees" and without impairing the Association's independence and its ability to represent, first and foremost, Independent telephone companies.

"Joint Committees," in which Bell members will have voice and vote, will impair that independence.

We think that anything that impairs the independence of the Association will be detrimental, politically and in other ways, not only to the Independent group in the telephone industry but to all of the telephone industry.

During the entire existence of the United States Independent Telephone Association all companies of the Gary Group eligible to membership in it have been members of it and have supported it financially and in other ways. During that time these companies, along with many other members of the Association, have zealously guarded the Association's independence and have worked to maintain it as a self-contained organization supported wholly by Independent interests and truly representative of Independent telephony. We believe that such a program, combined with open cooperation between the Association and Bell System when the interests of the two groups are identical, will be of benefit to the telephone industry as a whole.

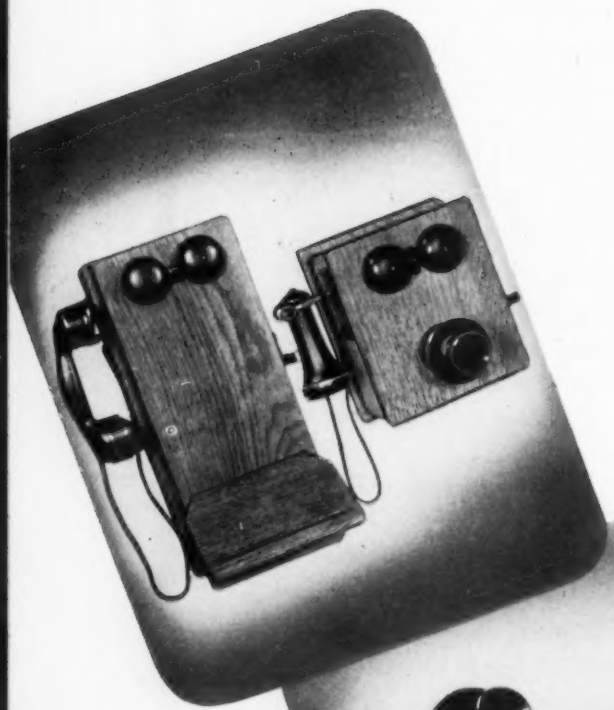
We cannot witness without strongly protesting against it what we believe to be the beginning of a gradual process of disintegration of the Association as a self-contained entity, which process, if continued, will destroy the independence of the Association and render it impotent to do many things beneficial to the telephone industry.

The companies of the Gary Group that are members of the Association will continue to oppose such disintegration.

GARY SERVICES AND INVESTMENT COMPANY

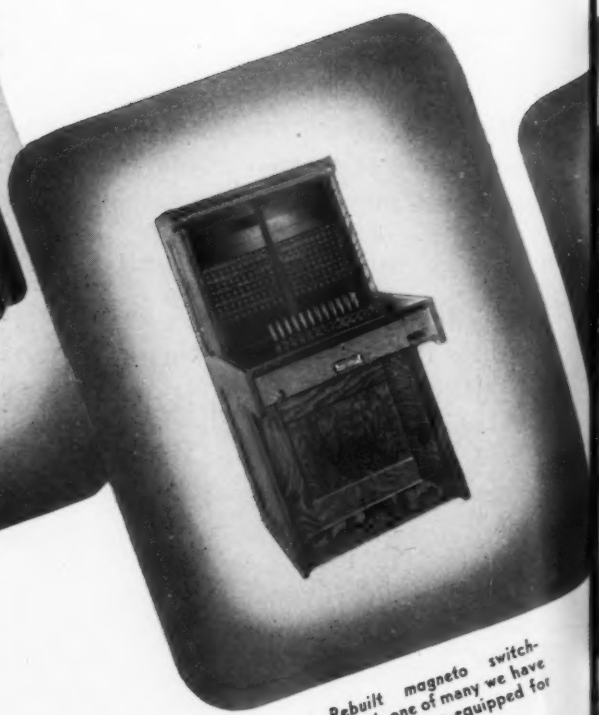
By: E. C. BLOMEYER,
Vice President and Chairman,
Policy Committee.

THIS LITTLE TAG M



Telephones like these can be made from your old magneto instruments, by using Autelco Rebuilding.

Dials, or dial blanks, can be added to your old telephones, for future dial operation.



Rebuilt magneto switchboard, one of many we have rebuilt and re-equipped for years of service.

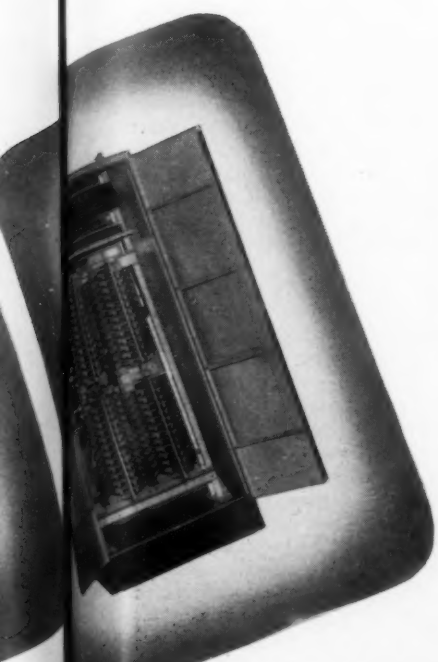
A BIG SERVICE!

Think of Autelco Rebuilding service as *your own* rebuilding shop —ready at any time to do any needed job of rebuilding of telephone apparatus. Whether it is just a few telephones to be rebuilt, or the progressive "going over" of your entire plant, AR service can take the job off your hands.

Try AR service on your telephones, switchboard apparatus, or other equipment that needs attention; see for yourself the thorough job we do. Every piece of apparatus is taken apart, unusable parts discarded and replaced, other parts refinished and tested. Then the apparatus is re-assembled, rewired and carefully inspected—all by regular factory methods.

The results: years of life added to your equipment, lower upkeep costs, better service for your subscribers.

Here's a BIG service for your company! Ask your Automatic Electric representative about it—or write us direct.



...omatic switchboard completely rebuilt and modernized by Autelco Rebuilding ...expert service.

AUTOMATIC ELECTRIC

Originators and Developers of Strowger Step-by-Step Machine Switching Automatic Dial Systems
Makers of Telephone, Signaling and Communication Apparatus . . Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions

AUTOMATIC ELECTRIC SALES CORPORATION, 1033 W. Van Buren St., Chicago 7, U. S. A.
Export Distributors: INTERNATIONAL AUTOMATIC ELECTRIC CORPORATION

THE PLANT MAN'S NOTEBOOK

BY RAY BLAIN • TECHNICAL EDITOR

FURTHER evidence of the need of some arrangement to hold a handset to the ear and mouth so that both hands may be free was noted recently in the Philadelphia ticket office of the Pennsylvania Railroad. The handset was clamped to an arrangement similar to a microphone stand at the proper height and angle so the receiver and transmitter would be in the proper position for a man standing. The clerk leaned his ear to the receiver, and cut-in on the line by operating a key with his hand. Perhaps a foot operated switch could be utilized to make the set entirely independent of the hands.

* * *

It is a good idea to purchase gas-filled cable. Such cable, on the reel, has a valve installed at each end. After the gas has been stabilized, the pressure at each end should be between 11 and 13 pounds per square inch at 60 degrees F. This tests the lead sheath and seals for possible manufacture defects. At the end of 12 hours, the pressure, after correcting for temperature change, should not be less than the stabilized value. The cost of this procedure is little and may save serious and expensive trouble later on.

* * *

According to *Time* and *Radio Craft*, the Navy's film recorder covered the Normandy invasion better than all reporters. The millions of Americans who listened to George Hick's broadcasts, recorded during those fateful minutes before the landing, will agree. Bombs, airplane motors, big guns and anti-aircraft fire replaced the often clumsy sound effects of dramatized news programs. This news was not dramatized; it was the stuff of which drama is made.

On-the-spot film records, a new art, has become the leading form of narrative. As such, it will have its effect on conventional reporting and fiction. The writer will have to revise his word-pictures of men in dangerous situations so they fit the facts known to his readers through actual reports from the scene. Where melodrama will lose, realism will gain.

* * *

When we have won the war we will have a complete pictorial record to prove just how it was done. This, undoubtedly, will be very useful in planning the defense of our land. It might be a good idea if telephone companies maintain a good photographic historical record of their plants. For example, a cable is installed and a picture made of the new job. A picture could be taken each year thereafter to record any changes. In this manner, weak points or other action would be revealed clearly. This practice would indicate many costly mistakes and avoid repetition of such mistakes. Perhaps such a system, designed for use by telephone companies, will be developed after the war.

* * *

It seems that more rolling towers could be used to good advantage in the telephone industry. One type of tower is made of tubular steel, welded together. Standard parts are used to erect towers as required for a particular job. Surely, a rolling tower is better suited and is also more convenient for installing a cable on the ceiling or along a wall than the conventional-type ladder. The safety factor of the rolling tower is also worthy of consideration.

* * *

It will require approximately one month to complete distribution of the 425,000 copies of Philadelphia, Pa.'s new telephone directory. The project has begun. A force of 350 men and women, and 450 school boys will handle the distribution and collect the old directories for salvage. The new directory contains 394,500 listings for Philadelphia subscribers and 149,000 for suburban subscribers.

* * *

It is surprising to note the number of new uses which constantly are being discovered for cable drying desiccant. Among the important new discoveries is its use as a drying agent for blood plasma and for moisture packing of communication equipment for shipment overseas.

* * *

Electrical fires, according to an article in the September issue of *Volunteer Firemen*, lead the list of fire losses in 1942, the latest year for which figures are available, with a total of $28,000,000. Numerically, fires caused by defective electrical equipment were second only to those caused by smoking. The wiring in telephone exchanges is usually good, but just the same an occasional inspection may avoid irreplaceable loss in these times.

* * *

The Philadelphia, Pa., *Inquirer* on November 6 explained how the Navy teaches sailors the knack of telephone talk. "Sound-powered" telephones which are not connected to the ship's electrical system, and, therefore, are less vulnerable to knock-out blows from bombs or shells, are in use on United States fighting vessels in all parts of the world. Proper use of the telephone is being taught to an average of 300 youths a month in a small brick building in the Philadelphia Navy Yard.

Under the guidance of professional speech and voice teachers who have joined the service for this specialized

"CLEVELANDS" . . . .

"TOPS" for BURIED CABLE and CONDUIT TRENCHING

•

"CLEVELANDS" Afford:—

- The fastest method of burying cable with the least outlay for equipment.
  Speeds in excess of 1000 feet per hour in open country.
- Minimum expense for property damage and right-of-way damage claims.
  Drain tile breakage immediately located and repaired.

• • •

Special models for digging trench in the congested areas of cities and suburbs are available.

THE CLEVELAND TRENCHER COMPANY

20100 ST. CLAIR AVE. *"Pioneer of the Small Trencher"* CLEVELAND, OHIO

"CLEVELANDS" Save More . . . Because they Do More

work, the trainees spend long hours learning to speak clearly and accurately over the new type telephones.

Teachers stress that the operators and their telephones are the "nerves" of any battle wagon, and that if a message is incorrectly given or repeated during combat, the life of every man aboard, as well as the ship, itself, is in jeopardy.

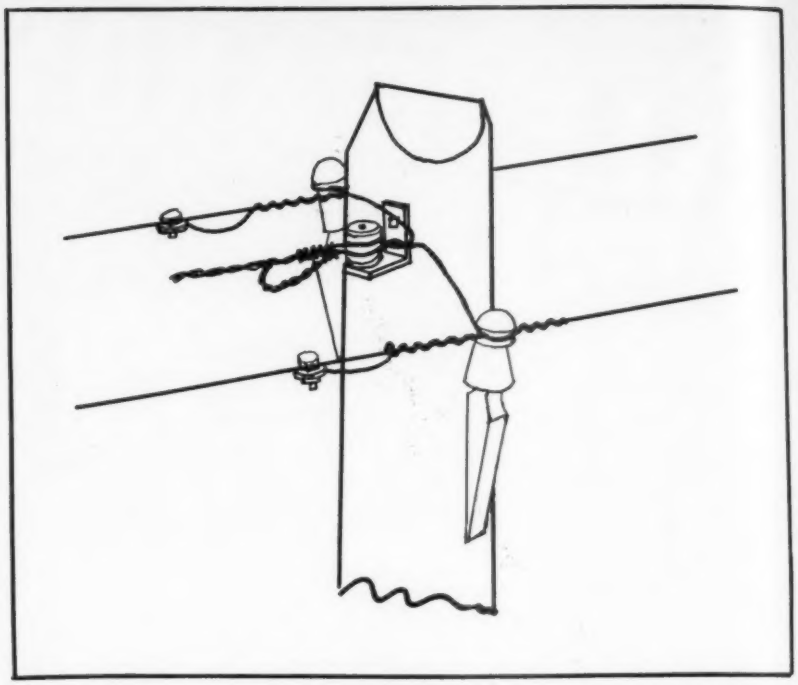
The trainees, who work in small groups, are supervised by Lieut. W. Fluharty, Boston, Mass., who admonishes each new student that "good speech can save a life; it can save a ship. Good telephone talkers are needed in every ship in our fleet. Put punch in the voice, give it 'oomph'."

* * *

The truck mounted elevated ladder will no doubt be more extensively used in the telephone field in the future. This vehicle has proved very popular in the power field for various purposes. It is our opinion that an elevated ladder would be highly desirable for certain types of telephone work. It also seems that an elevated ladder, mounted on a jeep, might prove an ideal arrangement.

* * *

Occasionally, we hear a telephone man ridicule the idea of heaters installed in line construction trucks, contending that linemen are growing soft. This derision is unworthy of serious consideration. Why should it be necessary for men to suffer from cold when riding long miles in a cramped position in a truck? Certainly these men are exposed to the elements while on the job and it would be only sensible to assume that they could perform a better and more efficient job after having arrived at their work in a comfortable condition. Busses and street cars are equipped with heaters so why not line trucks?



Sketch indicating how a drop wire may be attached to an open rural line. It is considered best to dead-end the drop wire on a knob instead of attaching to the glass insulator which also holds the line wire. The drop wire is attached to the line wire by the use of solderless connectors.

Truck heaters are now available which operate independently of the engine and burn any type of gasoline. These heaters are obtainable in capacities of 15,000 and 25,000 B.T.U. Both sizes are equipped with remote controls which may be used if required.

* * *

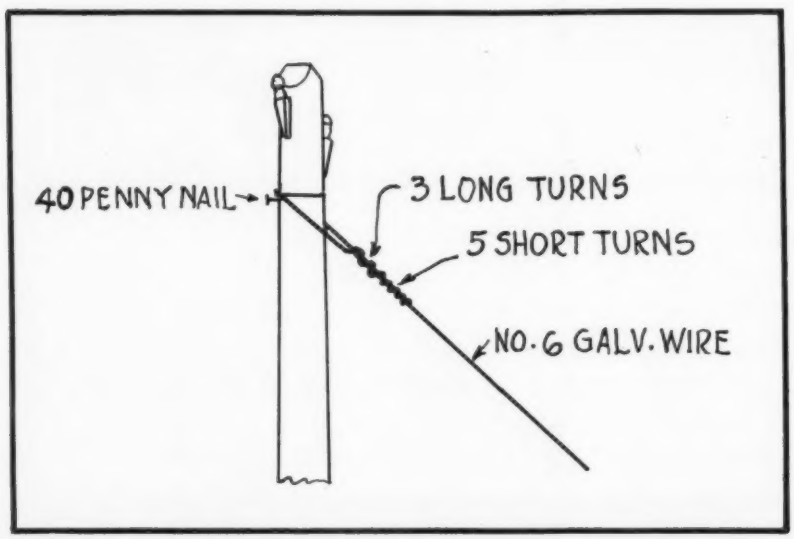
We have heard numerous rumors of late which indicate that in some localities, operating telephone companies are becoming alarmed at the rapid increase in telephone intercommunication service. We contend that this is a normal condition brought about by a general desire for a speed up in communication, necessary to meet wartime emergencies. Intercommunication of the modern variety supplements, but does not reduce, standard telephone service. Also, it acts as a balm for nervous executives and nail-biting secretaries.

* * *

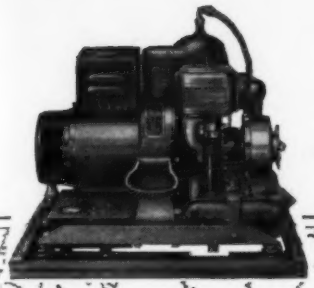
It is hoped that in the general rush for new business after the war someone will design and manufacture a convenient bedside table. It is suggested that this table contain a built-in radio set, a good reading lamp, smoking accessories, a book shelf and space for a hanging handset-type telephone.

* * *

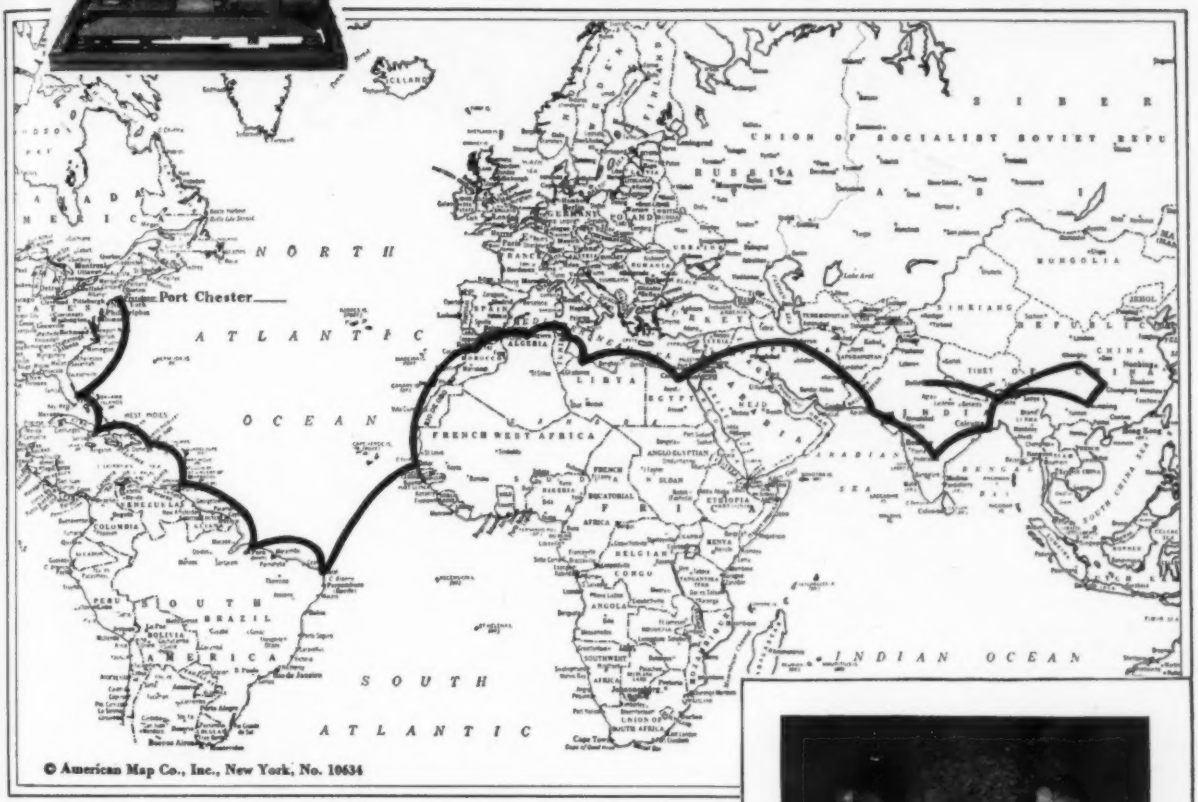
A soldier, returning from overseas, recently was asked how the telephone service was in Paris. He replied, "Far better than in London."



Rural line guying is most important but, contrary to the belief of many, it is not difficult. When messenger strand is not available, No. 6 galvanized wire may be used to advantage. This wire may be wrapped around itself or a compression-type sleeve may be used which makes a good job. A simple 40-penny nail may be used to keep the guy wire wrap from slipping down the pole.



HERE'S A TRIP
that will do you a Lot of Good

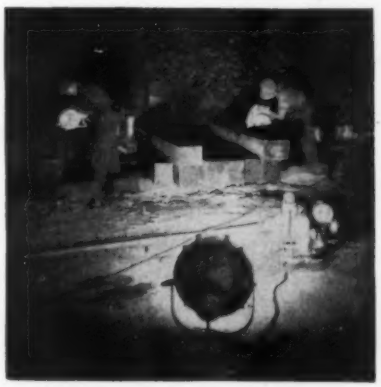


From Port Chester, New York, to Chungking, China . . . with plenty of stops in between.

Just one trip of many . . . made by a Homelite service man . . . to get facts . . . to find out how Homelite Portable Generators are performing and standing up under the tough conditions of war.

On trips like these . . . to Alaska, Africa, India and all the theatres of war, Homelite men get the "dope" first hand. And they transmit their information back to our engineering department where new advancements in design and performance are constantly being made to meet the pace.

Yes, trips like these will do you a lot of good. For they have piled up a wealth of priceless experience that will enable us to give you better generators, better pumps and better blowers, than you ever had before.



THE BENEFITS FOR YOU

Better cold weather operation . . . better hot weather operation . . . new cooling methods . . . advanced type bearings . . . less trouble and maintenance . . . much longer wear . . . more power . . . more portability . . . these and many other features will be but standard advantages of the New Homelite Gasoline-engine-driven Generators, Pumps and Blowers that you will get and use, after the war is over.

HOMELITE CORPORATION
PORT CHESTER, NEW YORK

PORTABLE PUMPS • GENERATORS • BLOWERS

DEHUMIDIFYING SWITCHROOMS IN THE TROPICS

By W. E. NICHOLS
Central Office Telephone Engineer
U. S. Army Signal Corps

WATER, the arch enemy of all things electrical, has, in one form or another, caused more damage to communication apparatus than any other known element. Damage from water in the inside telephone plant is generally visualized as the result of floods, fire extinguishing methods or similar sudden deluges which the plant development engineer tries to forestall by specifying high building sites, approved "foam" fire extinguishing equipment, special plumbing installation precautions and stormproof room and sash for the exchange building.

In the steaming hot, sea-level tropics, an entirely different water damage condition exists. Here, the entire area may be constantly submerged in highly saturated moisture vapor that can penetrate to the very core of telephone equipment, whether in buildings or out in the open. During the day, the air may be steamy hot with heavy rainfall that turns into vapor almost as fast as it strikes the ground, causing everything to become wet with absorbed moisture. One can be drenched with rain and yet soon be dry in the outside air and sun, but when the heavy moisture penetrates his clothing inside of a building, the rate of evaporation is very slow, thus causing extended dampness and discomfort. Again, during the evening and early morning hours, when the air temperature drops a few degrees, the resulting cooling of objects quickly causes the surrounding wet air to reach the "dew point," causing heavy condensation to take place.

A telephone instrument left on the office desk overnight, to which the outside air has ready access by nature of the general design of tropical buildings for comfort, in the morning, will appear to have been sprayed with fine moisture and needs always to be wiped off. Unless the best rubber-covered tropical cords are used, correct dialing in the morning may be impossible until the sun comes out. It is believed that machinery and equipment which is exposed to the constant night condensation deteriorates faster than it does when exposed to the daytime action of the sun and rain.

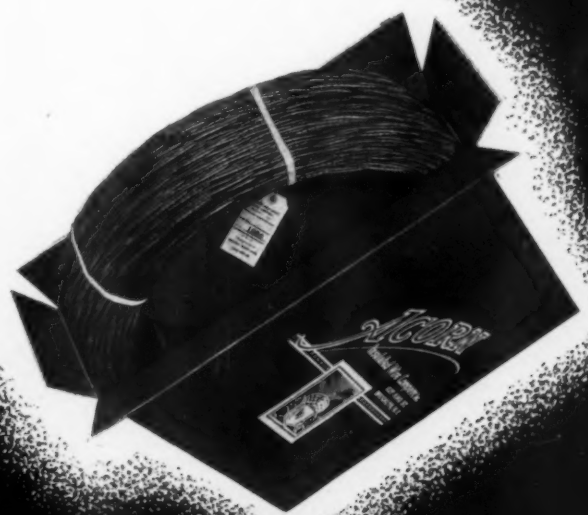
When damp air can get to the inside of switchboard cabinets and is not quickly forced out by some source of heat, very rapid mold, corrosion and general disintegration takes place which is called "fungus growth." In the tropics, this fungus growth makes itself manifest in many ways; different substances are affected in their own peculiar manner, depending upon their chemical and metallic composition. In general, electrical equipment breathes. The passage of current heats the coil or transformer to drive the occluded air out of the winding. When the coil cools, by having the windings de-energized, a vacuum occurs which draws the surrounding air into the very heart of the apparatus.

W. E. NICHOLS

In the tropics, such coils which are not properly impregnated with moisture repellent compound, quickly impregnate themselves with moisture from the air. Some manufacturers go to great lengths to impregnate coils, but do not give as much attention to the core or laminations around which the winding is placed. Most telephone offices in the tropics are full of repeating coils, whose cores are a solid mass of rust, and if these coils were to be torn down, it would be found that the rust extends through the entire lamination to the very inner layer of insulation between the winding and the core. In many cases, such coils will develop trouble and, when opened, a damp pasty mess will be found between the inner coil layers and the wet rusty core. This condition is greatly increased if the inner winding is connected to negative potential above ground.

A great deal of trouble has been experienced from moisture in part-time operated telephone switchboards and radio sets. Here again is the breathing cycle. The equipment is turned on in an isolated place, for sufficient time to warm up the unit thoroughly, and then

(Please turn to page 60)



ACORN INSULATED WIRE CO., INC., 225 KING STREET, BROOKLYN 31, N. Y.

LEICH SALES CORP., 427 W. Randolph St., Chicago • LINDSAY SUPPLY CO., 4815 Superior Ave., Cleveland

A Selected List of Telephone Books

In this war emergency knowledge is needed to help achieve victory. Technical books and information assume greater importance as a means not only of better fulfilling our niche in the war effort but of self-improvement. From this list of telephone books, with brief statements of their contents, employes may find one or more they will want to secure for study and reference.

• ***How to Build and Repair a Farm Telephone Line*, published by Telephony Publishing Corp.**

Eight-page booklet, unbound, 25 cents per copy to non-subscribers of TELEPHONY; special prices available to subscribers and to anyone ordering 25 or more booklets. This booklet, well-illustrated with photographs and diagrams, tells what was done to place a run-down farm line in good condition to furnish excellent service. The text describes how to attach wire to an insulator, how to attach brackets, how to set a pole, how to string wire, how to make a splice, how to protect telephone line from power line hum, how tree branches touching wires hamper transmission, how to connect drop wire to line wire, how to attach drop wire to house, how to connect house line to telephone, and how to connect the ground rod. The materials needed for a farm line are also listed.

• ***Rural Telephone Trouble*, published by Telephony Publishing Corp.**

Four-page reprint of an article published in TELEPHONY giving 33 magneto telephone and line troubles most commonly encountered, with suggestions as to the most likely cause of each —whether in the telephone set, the protector, the line, or the central office. Cost is 25 cents per copy to non-subscribers of TELEPHONY; special prices available to subscribers and to anyone ordering 25 or more reprints.

• ***Fundamentals of Telephony*, by Arthur A. Albert (1943) 366 pages $3.25**

This elementary book, intended for beginning students and for telephone workers, is devoted exclusively to telephone communication. The first four chapters present briefly the principles of electricity and acoustics upon which telephone practices are based. The book then considers the following subjects: Telephone transmitters, receivers, telephone sets and circuits, telephone lines, manual telephone systems, dial telephone systems, loading, telephone measurements, noise and cross-talk, and repeaters and carriers.

• ***Electrical Fundamentals of Communication*, by Arthur L. Albert (1942) 554 pages $3.50**

This book deals with fundamentals of electricity as applied to communication, including telegraphy, telephony, and radio. Contains basic electric circuits and phenomena using illustrations, terminology and problems from communication industry standpoint. Contains tables and 359 excellent drawings; is non-mathematical and clearly written for communication people having little or no college training. Especially suited for use in telephone training courses for new employes. Also valuable for employes who wish to extend their knowledge of electricity. A summary as well as review questions and problems given at end of each chapter.

• ***A Telephone Rate Case*, by Edward D. Smith (1941); 223 pages $5.00**

Written simply and clearly by an attorney for a telephone company, this book gives a bird's-eye view of the general rate regulatory background, and then outlines the steps for preparing a telephone rate case. Company executives as well as legal counsel dealing with rate matters will find much valuable and helpful information in the book. There is a comprehensive table of case references.

• ***Soldering for Workshop, Farm and Home*, by John Bonert (1941); 111 pages, 28 illustrations $1.25**

Valuable soldering information for telephone plant men, particularly apprentices, is presented in this book written by a telephone man with years of practical experience. The book discusses soft soldering, fluxes, tinning, soldering coppers, wire splices, soldering on lead, closing seams in a split cable sleeve, soldering and sweating with a torch, joints, hard soldering or brazing, construction of a soldering copper holder and pad, etc. No scientific terms or complications have been used in the book, which is intended to help the beginner or to refresh the memory of an experienced worker.

• ***Electrical Communication*, by Arthur L. Albert (1940); 534 pages (second edition) $5.00**

Presentation of electrical theory of communication, including vacuum tubes, networks, filters, and discussion of entire industry. Various subjects considered as related to one another in modern communication systems. Designed as a college textbook and reference book for those having technical training. Others will find much of value in it, as use of mathematics has been limited but not at a sacrifice of engineering exactness.

• ***Transmission Networks and Wave Filters*, by T. E. Shea (1929); 470 pages $6.50**

A specialized book which deals with principles of transmission networks, electric wave filters, and composition of transient waves. It is intended for student engineers or graduate engineers.

• ***Storage Batteries*, by George W. Vinal (1940); 464 pages (third edition) $5.00**

The physical and chemical facts and theories about storage batteries are summarized and their various applications described in this book. Emphasis is laid on the scientific principles of storage batteries without permitting the text to become too technical. The physical, and chemical properties of the materials used in batteries are discussed as they relate to battery performance, and a general description of manufacturing methods given. Especial attention is directed to the operation and testing of batteries.

• ***Fundamental Electronics and Vacuum Tubes*, by Arthur L. Albert (1938) 422 pages $4.50**

The increasing use of vacuum tubes in telephone work makes this non-mathematical book of practical value to persons in engineering and operating branches of telephony. The book discusses the principles of electronics and the theory of vacuum tubes, photocells and copperoxide varistors in telephone circuits and radio. It delves into the theory of these devices and the design and operation of circuits in which they are used.

• ***Electrical Engineers' Handbook*, electric communication and electronics, volume 5, by Harold Pender and Knox McIlwain (1937); 878 pages $5.00**

This reference book for communications engineers contains engineering data and formulae concerning modern networks. Discussions are presented of telephone circuits (local, toll and program facilities), radiotelephone systems, and high frequency transmission, profusely illustrated with line drawings, as are the other sections. These sections include acoustics, telegraphy, sound-reproduction systems, facsimile transmission, television, electronic control and navigation equipment.

• ***Communication Engineering*, by W. L. Everitt (1937); 727 pages (second edition) $5.00**

Book designed for engineers and those with technical training; gives fundamental principles of telephone, telegraph and radio communication without going back to the beginnings of the entire electrical engineering field. Transmission networks and circuits, involving coupled circuits, impedance transformations, equalizers and bridge circuits are treated. Inductive coordination is discussed with the latest theories for minimizing interference. Discussion is given of other links in the circuits which make possible radiotelephony or carrier-current systems, including vacuum tube detectors and amplifiers. Mathematical ideas, beyond calculus, are introduced just before they can be applied.

• ***Inductive Coordination of Electric Power and Communication Circuits*, by Laurence Jay Corbett (1936); 161 pages $3.00**

This excellent book discusses the nature of power transmission and of communication transmission, the effect of magnetic and electric induction and various influence factors. Susceptiveness and coupling factors, effects of conductor arrangements, transpositions in power and communication circuits and their coordination, power system wave shape, control of residual voltages and currents and many other phases are discussed. This book should contribute to a fuller understanding by power and communication engineers of each other's problems.

• ***Telecommunications — Economics and Regulation*, by James M. Herring and Gerald C. Gross (1936); 544 pages $5.00**

Dealing primarily with the economic and public service aspects of the communications industries, the major purpose of this book is to evaluate existing state and federal regulation in the light of the requirements of national policy, as determined by the present federal administration. The subjects covered include the growth and development of the telegraph industry, submarine telegraphy, the telephone industry, the development and history of radio communication and broadcasting, state and Federal regulation of the communications industries.

• ***Telephone Theory and Practice*, by Kempster B. Miller (1933); 1414 pages $15.00**

A set of three volumes, "Theory and Elements" (1930, 468 pages, $5); "Manual Switching and Substation Equipment" (1933, 439 pages, $5); and "Automatic Switching and Auxiliary Equipment" (1933, 494 pages, $5). Volumes may be purchased separately or as a set. This series replaces "American Telephone Practice" by the same author, published early in the century. The set comprises an excellent source of accurate information of entire subject of telephony.

• ***Elements of Utility Rate Determination*, by J. M. Bryant and R. R. Herrmann (1940); 464 pages $4.50**

Based on tested and workable methods, this book discusses factors, methods and problems of evaluating public utility property and service for rate-making. The essentials of valuation, depreciation, expense, return, etc., as factors in establishing proper rates for various utility rates are given. Citations presented from background and key cases decided by commissions and courts.

TELEPHONY PUBLISHING CORP.

608 So. Dearborn St. Telephone: Wabash 2435 Chicago 5, Ill.

"HE WHO BUILDS A BETTER
MOUSE-TRAP, THOUGH IT BE
IN THE MIDDLE OF THE WOODS,
WILL FIND THAT THE WORLD
WILL BEAT A PATH TO HIS DOOR!"

— Ralph Waldo Emerson.

The SOUTHERN ELECTRIC & TRANSMISSION CO.

Communication Engineers

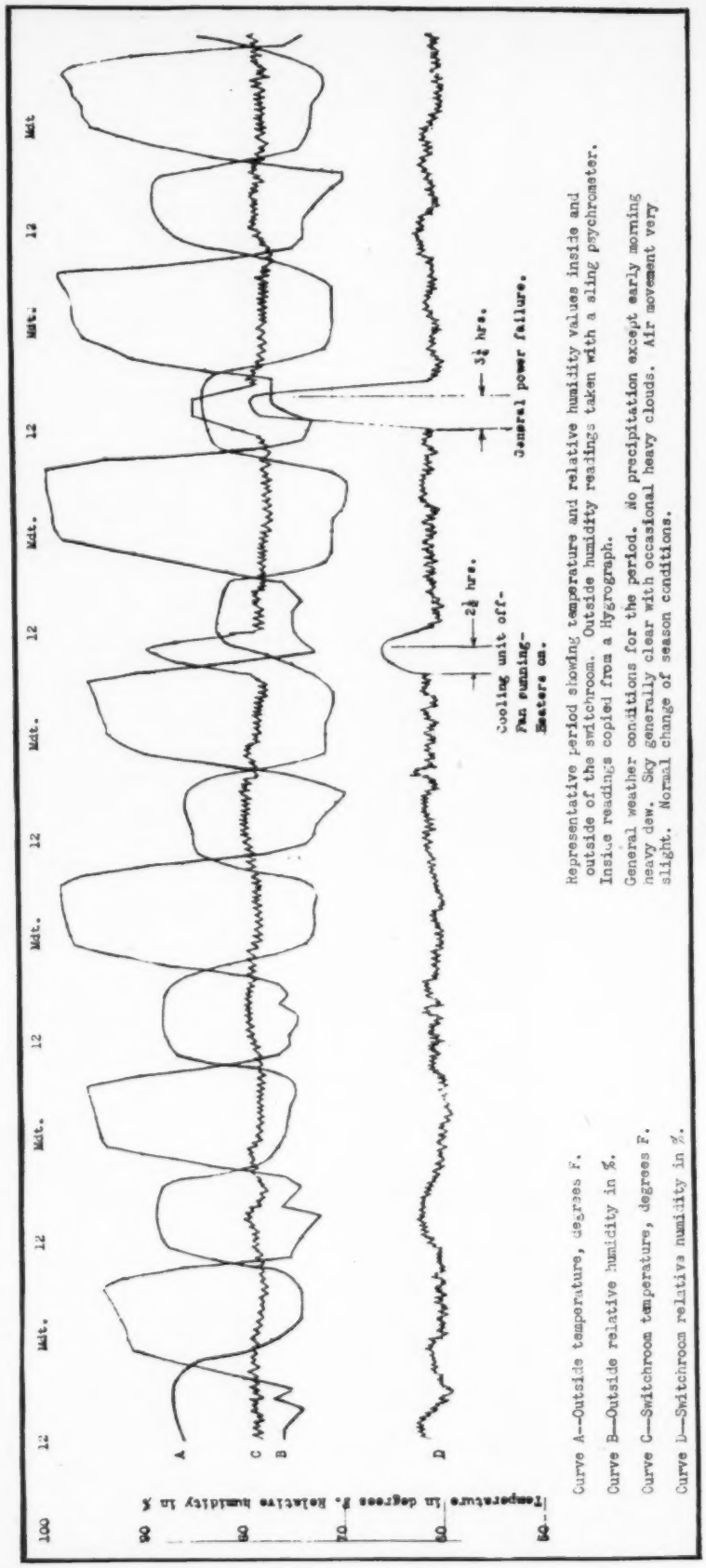
MANUFACTURERS OF

Telephone & Telegraph Carrier Equipment • Voice Repeaters • Transmission Measuring Sets
Transformers, wave-filters and other accessories.

Pioneers in "A.C.-operated" Wire-transmission Equipment since 1926.

3127 HOLMES STREET, DALLAS, TEXAS

Our NEW CATALOG will be ready for distribution about Jan. 5th


Temperature in degrees F. Relative humidity in %
100
90
80
70
60
50
Mdt. 12 Mdt. 12 Mdt. 12 Mdt. 12 Mdt. 12 Mdt. 12 Mdt.
A
C
B
D
2½ hrs.
Cooling unit off-
Fan running-
Heaters on.
3½ hrs.
General power failure.
Curve A—Outside temperature, degrees F.
Curve B—Outside relative humidity in %.
Curve C—Switchroom temperature, degrees F.
Curve D—Switchroom relative humidity in %.
Representative period showing temperature and relative humidity values inside and outside of the switchroom. Outside humidity readings taken with a sling psychrometer. Inside readings copied from a Hygrograph.
General weather conditions for the period. No precipitation except early morning heavy dew. Sky generally clear with occasional heavy clouds. Air movement very slight. Normal change of season conditions.

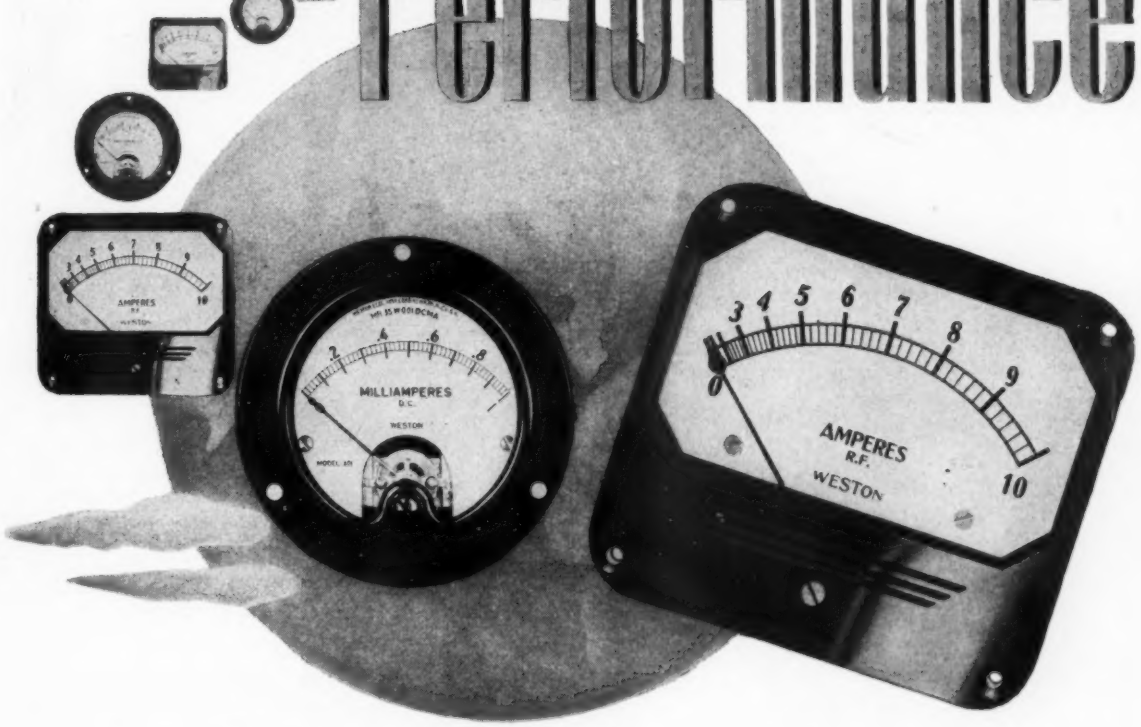
Hydrograph Chart

Typical installation of demumidifying unit serving a two-floor office. Grills at the top are partially open to serve the frame room while the main air duct goes through the ceiling of the ground floor and near to the ceiling of the room above for lateral distribution. Return of the air from the top floor flows through a ceiling opening above the frame room in a corner diagonally opposite the dehumidifying unit to effect complete circulation on both floors.

turned off without benefit of auxiliary heaters. The warm air flowing out of the switchboard jack openings and radio grills ceases, and damp, outside air flows back through these openings, with the same result that more moisture is drawn into the equipment than is driven out.

The writer has a standard radio that has not been turned off in five years. The tube life is slightly shortened, but there has been no failure of any part from moisture even when the set has been constantly exposed to night air conditions. At least 50 similar sets which were operated for an hour or so each day have been beyond repair for many months. In one case, a fire in a switchboard was traced to the board being too wet. In this case, the fire

known Performance



for destinations known or unknown

Today, our electrical equipment encircles the globe; some serving at Greenland's ice cap or in Kiska's fogs . . . others stewing in the swamps of a Pacific atoll.

With the destinations of war-products totally unknown, manufacturers logically have preferred "building-in" WESTONS on their control panels. They know that a WESTON will perform dependably *anywhere* . . . that there is sound reason behind WESTONS acceptance as the *international standard.*

And tomorrow, with equipment reaching known markets, instrument preferences will remain unchanged. For while human life no longer will be at stake, *reputations will.* So manufacturers will continue to "build-in" the instruments which consistently tell-the-truth . . . to build broader market acceptance and customer good-will, and assure highest efficiency from the machines which bear their name.

- Laboratory Standards
- Precision DC and AC Portables
- Instrument Transformers
- Sensitive Relays
- DC, AC, and Thermo Switchboard and Panel Instruments
- Specialized Test Equipment
- Light Measurement and Control Devices
- Exposure Meters
- Aircraft Instruments
- Electric Tachometers
- Dial Thermometers

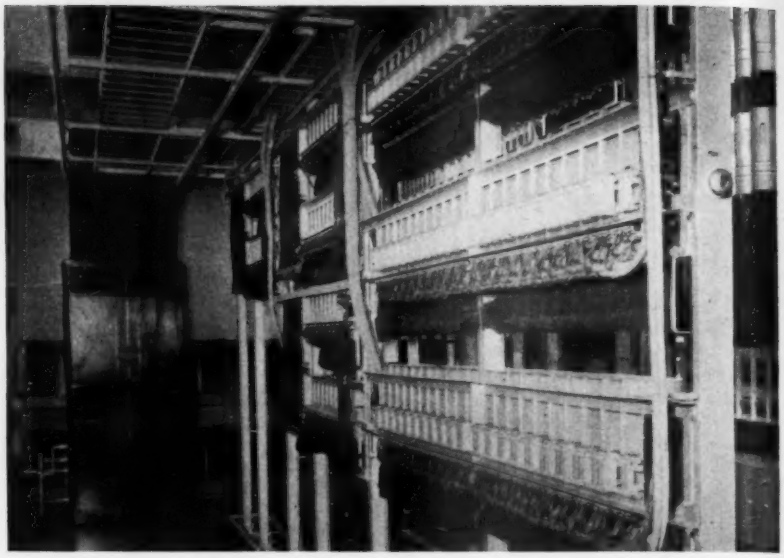
Weston

WESTON ELECTRICAL INSTRUMENT CORPORATION
576 FRELINGHUYSEN AVENUE, NEWARK 5, NEW JERSEY

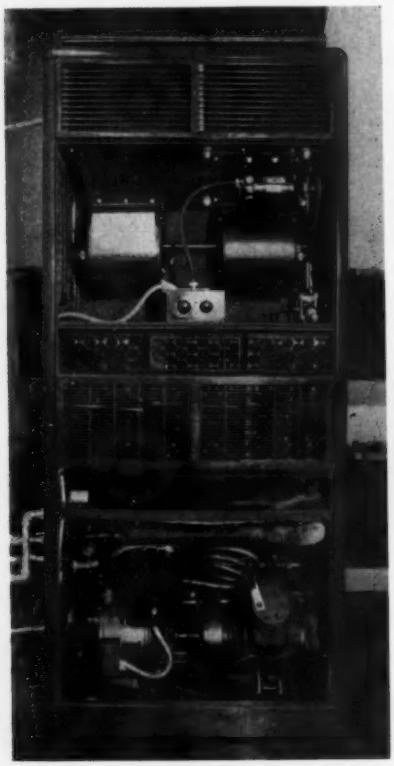
FOR OVER 55 YEARS LEADERS IN ELECTRICAL MEASURING EQUIPMENT

probably dried out the switchboard to some extent, but the fire fighting crew quickly overcame this condition by the liberal use of water, instead of "foam" extinguishers, which were being painted on that particular day.

The outside telephone plant, when under the cover of lead sheath with good moisture repellent drop wire and approved sealed terminals, can be maintained to fairly good standards of insulation resistance even in the worst humid location. In the inside plant, great strides have been made to develop high insulation materials going into the manufacture of switchboard equipment which will be capable of withstanding considerable moisture penetration. However, in the case of fixed telephone installations, large portions of the equipment are necessarily exposed to the surrounding atmosphere, which in countries such as Panama, averages 80 per cent relative humidity for the greater part of the year, and much higher during other periods.



Typical installation of dehumidifying unit serving a one-floor switchroom. The unit is located in the far corner of the room with the dehumidified air being forced upwards and deflected diagonally across the room by the arched ceiling construction, returning across the floor through the equipment to the unit for recirculation.



View of the dehumidifying unit showing location of the essential apparatus. From bottom to top: Compressor unit with starting box with high and low pressure cut out control. Condensate drip pan. Air entrance grill in front of dust filter behind which is the cooling unit. Temperature and unit control panel. Twin centrifugal fan. The plenum chamber. Plywood air duct. To the left is the plumbing for the circulating water for the compressor and condensate drain. Above is the plenum chamber heater-contractor under the control of the hygrostat, located at the distant end of the room. Note the condensate water on the drip pan.

Since the amount of moisture which can be contained in a given amount of air is greater at higher temperatures than at lower temperatures, many small switchboard equipment rooms, in the past, have been kept comparatively dry by electrical heating to maintain inside temperatures higher than that of the outside air, and to prevent sudden temperature changes over the equipment. Obviously, such room temperatures were very uncomfortable to work in and could not be maintained in large switchrooms.

SUB-CYCLE

A FOOL-PROOF – ECONOMICAL SOURCE OF RINGING CURRENT

BUILT FOR HEAVY DUTY

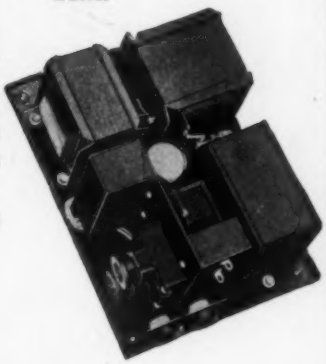
SIX MODELS for loads from Small PBX to Large Central Office.

Sub-Cycle is as near the Ideal Ringing Converter as can be made. It is practically fool-proof—you install it and then let it alone—and it will deliver long years of trouble-free signaling service. With Sub-Cycle there is no routine maintenance—nothing to adjust—no moving parts—no radio interference and it is quiet and economical in operation.

For better ringing service at low operating cost install Sub-Cycle.

ECONOMICAL IN OPERATION

OUTPUT CAPACITY 7½ watts to 40/50 watts.



ALSO PULSATORS

Sold By Leading Distributors

THE LORAIN PRODUCTS CORPORATION—Lorain, Ohio

For American Telephone Men— The World's Finest Poles

TAYLOR-COLQUITT CO. TIMBER CONSERVATION

Photo by U. S. Army Signal Corps

FROM ENGLAND, and from many other parts of the world, the men of the U. S. Army Signal Corps look to the United States for pressure-creosoted telephone poles of the highest quality, and in the enormous quantities required for military construction. Only the United States has the forests, and the processing plants, to meet their needs.

For many months, these military needs have had first call on Taylor-Colquitt production. But we look forward to the day when we shall again be able promptly to meet *your* needs.

Products distributed to Independent Telephone Companies by AUTOMATIC ELECTRIC SALES CORPORATION, 1033 W. Van Buren St., Chicago 7, Illinois.

TAYLOR-COLQUITT CO.
SPARTANBURG, S. C.
PLANTS AT
SPARTANBURG, S. C. AND WILMINGTON, N. C.

Personnel who were required to work in these heated rooms perspired profusely and sometimes dripped salty moisture on the apparatus, while, at the same time, maintenance was apt to be inferior in the haste to get out into the fresh air. Switchboard operators' hands were generally wet, causing plugs, cords and key shelves to be continuously damp. The common practice was for each operator to keep a towel on the position with which to dry his hands. New manual switchboards, after six months, had the appearance of an old board, while operators, working under these humid conditions, were generally irritable and rough with the board, causing excessive breakage and wear.

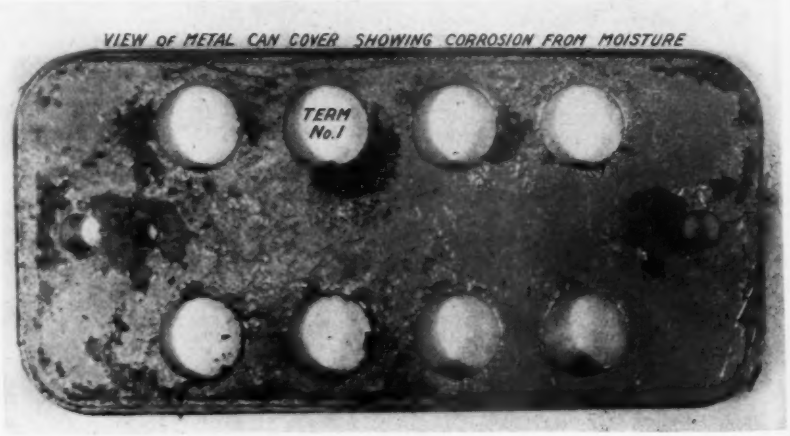
With the proposed installation of automatic equipment to replace manual offices, it became apparent that some mechanical means would be necessary to control the humidity in these new switchrooms if great equipment damage were to be avoided. Dehumidifying, using air conditioning machinery, was the obvious answer. With such equipment it would be possible not only to control the temperature and humidity, but also to control cleanliness, ventilation and circulation.

By controlling the temperature, the working conditions would be so greatly improved that a high standard of maintenance could be requested. By controlling the humidity through removal of excess moisture from the air, insulation resistance could be properly maintained and corrosion eliminated. By controlling cleanliness through filtering the air free from dust, switching equipment could be kept clean, thus promoting long life for the office, and better service throughout the system. By controlling circulation, hot spots are eliminated to provide uniform humidity throughout the switchrooms.

Since each of these functions must be performed automatically and simultaneously, to produce proper air conditions with respect to humidity and comfort, a standard air conditioning unit of three-ton capacity was installed in each automatic telephone office to serve the switchroom, frame and power room and the attendant cabinet room. The three rooms mentioned averaged a total of 18,000 cubic feet for each building, with an average personnel load of three men and three women.

The dehumidifying unit, which is typical of several such machines available on the normal market, uses freon gas compressed by a direct connected three horse-power, three-phase motor-driven, water-cooled compressor. Air is circulated through the unit cooling coils to the insulated plenum chamber by a twin centrifugal fan rated at 1,900 c.f.m. (cubic feet a minute), which is belt-driven by a one-third horse-power motor. The unit, which is 7 ft. high, 3 ft. wide, 20 in. long, weighing 1,050 lbs., is self-contained, easy to clean, quiet running and has

(Please turn to page 88)



His Message Must Go Through!

IN THE ARMY
. . . AND AT HOME

RAY-O-VAC BATTERIES

Carry the Words of Victory

Crouched in the front line, the observer directs death and destruction in the enemy entrenchments. Along hastily laid telephone lines, words come through strong and clear, thanks to Ray-O-Vac batteries with their preserved power. Ray-O-Vac batteries, as they have since 1906, are powering the message through, on every fighting front, at home and abroad.

RAY-O-VAC COMPANY
Madison 4, Wisconsin

Additional factories: CLINTON, MASS.; LANCASTER, OHIO; SIOUX CITY, IOWA; FOND DU LAC, WIS.; MILWAUKEE, WIS.

TAR HEEL INDEPENDENTS MEET

And Lay Out Future Plans

By GEORGE ROSE
Carolina Telephone & Telegraph Co.
Tarboro, N. C.

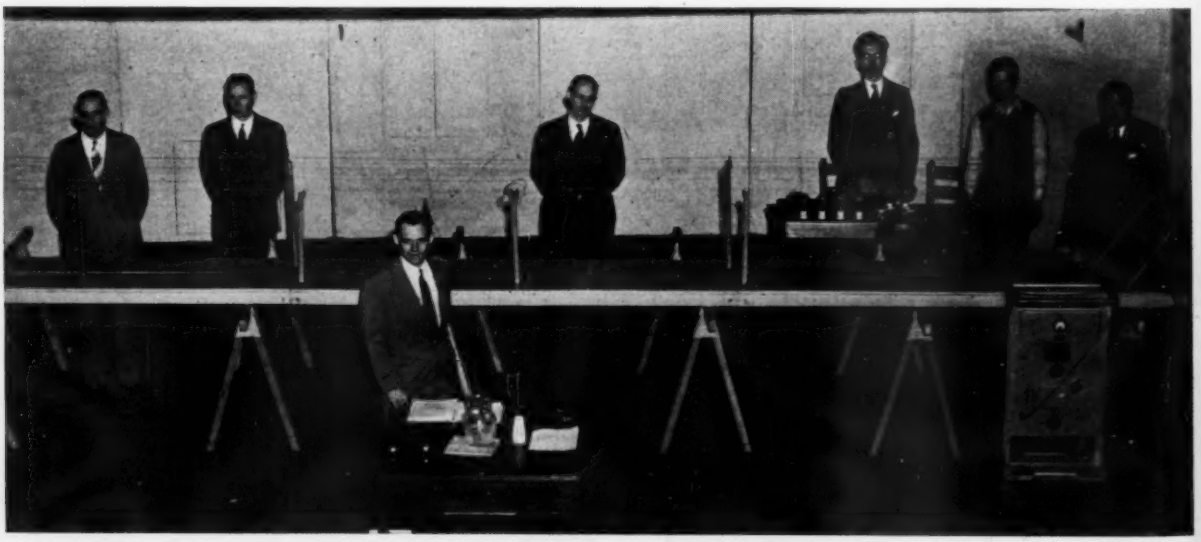
NOVEMBER 13 and 14 found well over 100 North Carolina Independent telephone men and women gathered at Pine Needles Inn, Southern Pines, to attend their 12th annual convention. The entire facilities of the inn were turned over completely for the work and play of the conventioners.

The trend of the entire convention leaned toward postwar problems, the major theme being the responsibility of the industry in furnishing adequate telephone service to rural subscribers.

The following officers were elected for 1945: President, W. E. (Gene) Sparger, Mount Airy; secretary-treasurer, E. W. Olschner, Tarboro. The bylaws of the association were amended to permit the appointment of three vice presidents: R. S. DuRant, Tryon, was named vice president on the board; Robbins Tilden, High Point, and C. C. Blades, Elizabeth City, were elected as vice presidents-at-large. All directors were re-elected. They include: Mr. Sparger; Mr. DuRant; Mr. Olschner; John Morris, Roxboro; J. E. Blades, Elizabeth City; Ralph Van Trine, Durham; E. C. Heins, Jr., Sanford; E. O. Freeman, Aberdeen, and R. M. Tucker, High Point.

In his address at the first day's meeting, retiring President John Morris pointed out the good work that had been done during the year by the various committees, placing particular emphasis on that of the Traffic Committee, which, under the able guidance of W. C. Darrow, Tarboro, had inaugurated a program which should be of real assistance to member companies. He strongly urged that this committee be continued under the same head and that it receive every cooperation from future officers.

President Morris continued with a pat on the back for R. E. Kepler, Durham, secretary-treasurer, who so ably performed his duties in keeping North Carolina companies abreast of the hap-



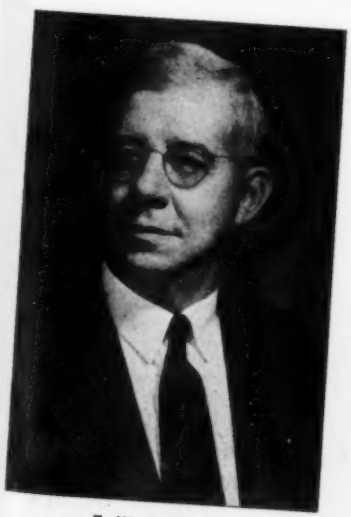
J. W. RIMSTIDT, Southern Bell Telephone & Telegraph Co., conducting the noise demonstration at the North Carolina Independent Telephone Association convention. Assisting are C. M. BURNS, J. S. DAY and C. R. JONES, all of the Carolina Telephone & Telegraph Co.; W. C. BURNETT, Southern Bell Telephone & Telegraph Co.; HERBERT OLIVER, Carolina Telephone & Telegraph Co., and M. B. WILEY, Southern Bell Telephone & Telegraph Co.

W. E. SPARGER

penings in the industry and in maintaining their interest in the association. In concluding his address, the president expressed a hope that the association would become of more and more service, and urged the members to bring more of their problems to the attention of the association, pointing out "that the strength of the association depends just as much as the strength of our business, on one thing—service."

In his report, retiring Secretary-Treasurer R. E. Kepler outlined to the convention the association's excellent financial condition. He also pointed out that during the year, there was a gain of 22 individual members and five associate members. Reference was made to the loss of an associate member, M. A. (Marty) Bellion, Chicago, who passed away recently.

J. R. Porter, Tarboro, former president of the United State Independent



E. W. OLSCHNER

STROMBERG-CARLSON
RECOMMENDS—

Look for this Trade-Mark

MTCo

"The Stamp of Character"

Product of

T. J. MOSS TIE COMPANY

Poles bearing this trade-mark are your guarantee of the highest quality creosoted southern yellow pine poles.

Every pole bearing this mark is completely supervised from tree to consumer by men experienced in the industry.

Crapo HIGH-TENSILE LINE WIRE

For Long-Span Low-Cost Lines

Construction costs are reduced to a new low level, maintenance expense is minimized, wherever **Crapo** HTL-85 and **Crapo** HTL-135 High-tensile, Low-resistance Line Wires are used. These revolutionary wires, with their superior strength, make possible rural lines with span lengths one and one-half to two and one-half times greater than were practical heretofore.

Crapo HTL-85 permits spans to 225 feet in heavy, 325 feet in medium, and 375 feet in light loading districts; provides stronger spans on existing pole structures.

Crapo HTL-135 makes possible spans of from 350 feet in heavy to 500 feet in light loading districts. Both wires possess superior telephonic transmission qualities.

Crapo HTL-85

Crapo HTL-135

Write for technical data!

STROMBERG-CARLSON

PROGRESS IN TELEPHONY

STROMBERG-CARLSON COMPANY

Factory and General Offices: Rochester 3, New York, U. S. A.

Branch Offices: Chicago, Kansas City, San Francisco, Toronto

2,000,000 New Customers WAITING FOR SERVICE

● A recent survey indicated that 2,000,000 rural homes not wired could use electricity to advantage. Of these, 400,000 are near existing lines and 1,600,000 will have to be served by new lines.

The building industry is talking in terms of 1,000,000 new homes a year for the first five years after the war. This means a vast increase in line load in urban communities.

This construction indicates a huge backlog of demand for telephone service.

Discount these figures as you will—the fact remains that public utility companies face a big program of line construction after the war.

Klein tools and equipment will be ready for the linemen and electricians working on this expansion program. The Klein line of tomorrow will continue to offer the same high quality—the same regard for safety that has characterized all equipment carrying the name Klein "since 1857."

ASK YOUR SUPPLIER

Foreign Distributor:
International Standard Electric Corporation, New York

This book on the care and safe use of tools will be sent without charge upon request.

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
3200 BELMONT AVENUE CHICAGO 18 ILLINOIS

J. P. BOYLAN

Telephone Association, introduced J. P. Boylan, Rochester, N. Y., president of the USITA, who delivered an address on postwar developments, bringing to the convention an insight on the development of equipment capable of supplying telephone service to rural areas by use with telephone, power or REA lines.

The report of the Traffic Committee, prepared by Mr. Darrow, chairman, was read by Mr. Kepler in the absence of Mr. Darrow, and brought to the convention the accomplishments and plans of the committee. The report explained the decision of the committee to provide traffic assistance to member companies; of the framing of a series of five letters designed to call attention to the need for traffic training, supervision and engineering. The sixth and final letter, which was in the form of a questionnaire, endeavored to determine if traffic assistance was desired by member companies.

The response, he said, had been favorable, resulting in the development of a plan which will be recommended to the incoming Traffic Committee for presentation to the new board of directors of the North Carolina association, whereby, it is proposed to conduct two or three classes for chief operators to instruct them in operating practices, central office management and the use of peg counts. Mr. Darrow advised that there probably will not be any cost for these classes other than the expenses of those attending.

In the second day's business meeting, an address was delivered by H. M. Stewart, Fort Wayne, Ind., former secretary of the Pennsylvania Independent Telephone Association.

In dwelling briefly on the tax situation, Mr. Stewart advised that it is generally supposed that excess profits

H. M. STEWART

and surtaxes will be eased, if not repealed, soon after hostilities have ended and that there may be some relief in excise and other so-called "nuisance" taxes, but he added, "The service requirements of the national debt, coupled with large appropriations for public construction and rehabilitation programs will, however, leave little room for marked reductions in present levels of tax income."

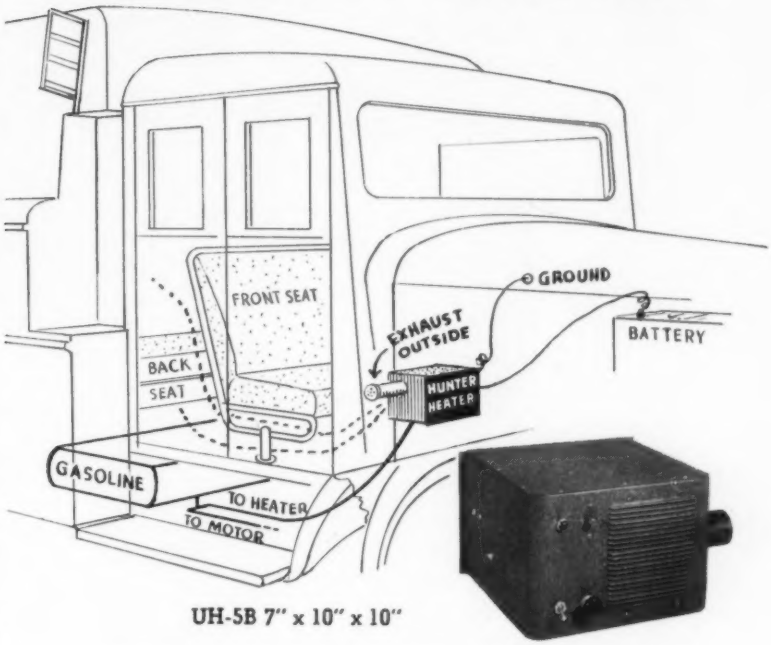
He paid tribute to the hard work of the USITA's Tax Committee which has been cooperating with both business and political leaders in a search for a more equitable solution to the present complicated and cumbersome tax structure.

In discussing the matter of government regulations, Mr. Stewart advised that "we see little or no reason to fear a continuation of many of the controls imposed by the war. We may expect, however, more aggressive administration on the part of prewar regulatory bodies. Since rate structures must, of necessity, rest upon values and costs, it is only natural that commissions shall grow more exacting in their accounting requirements."

The personnel problem also came in for some discussion by Mr. Stewart, who stated "If our business is to prosper in the postwar era, we must be prepared to bid for our share of the intelligent and ambitious young men and women needed to replenish and supplement the thinning ranks of the pioneers who created and built the industry, and what other industry holds out a more challenging and satisfying future to enterprising young people? Independent telephony is truly the epitome of free enterprise."

In discussing station development, Mr. Stewart said, "Most leading tele-

CONSTANT DEPENDABLE PERSONNEL COMFORT



UH-5B 7" x 10" x 10"

Hunter Gasoline Cab Heaters Are Independent of Engine Operation

A Hunter Heater connects directly to the main tank, pumps its own fuel with a built in autopulse pump. You can see by the schematic drawing of a typical personnel cab above that installation is simple. . . . four bolts, a connection to the gasoline tank, wires to the battery and ground, a hole for the exhaust. Blower will not overload a good generator and battery setup, can even be operated when engine is cut off, providing comfort for line crew when on the job as well as on the haul. Combustion is "Sealed-in-steel", exhausts to outside of vehicle. Heat volume can be regulated. Write now for full information.

HUNTER AND COMPANY
Transport Equipment
CLEVELAND • OHIO
1562 EAST SEVENTEENTH STREET

There's a Lot in a Transformer That You Can't See . . .

Of course we are proud of the appearance of ADC Transformers. One of our greatest satisfactions however, is in the way they are designed and built—for it is upon these qualities that ADC performance has been achieved and maintained.

It might be easier to make transformers some other way, but we enjoy doing our work the right way—and that means a lot to all of us here at ADC.

SEND FOR LATEST CATALOG!

ADC

Audio Development Co.

2833 13th Ave. S., Minneapolis, Minn.

phone men are expecting a pronounced drop in station counts soon after the Pacific war, but the long range outlook is more hopeful for the reason that all signs point to a period of industrial activity and trade during the reconstruction period. We must not be unmindful, however, of the keen competition we will face in the market for the consumer's dollar and it is not going to be easy to gain and hold our share of the business."

The matter of adequate rates was also discussed. The speaker declared that, "Too many exchanges are still trying to get along on World War I local service rates. Literally, thousands of these exchanges will either have to revise their rate structures or surrender their franchises. It is true that many are now enjoying a fair degree of comparative prosperity, but we must remember, however, that a large slice of current income is derived from abnormal toll business. It is to be hoped that the flow of toll traffic can and will be maintained at levels considerably above the prewar peak, but we certainly must expect a drop in current toll receipts. Add to this the rather certain possibility of labor rates being pegged at somewhere near present standards, or even higher, and the odds are stacked against old and obsolete rate structures."

In Mr. Stewart's concluding remarks regarding mechanical innovations and rural telephone problems, he said, "Rural telephony is not new to Independent telephone people. It is as old as industry. We have already noted that the very roots of the Independent telephone business feed on the crossroads and rural communities. I am confident that every Independent telephone man in this country is alert to the challenge and that the rural telephone situation will continue to have the preferred and conscientious attention of an aggressive industry. I am sure every hopeful scientific discovery or economic shift will be thoroughly explored by practical men in order that the greatest possible number of people, wherever they may be, will have the finest telephone service at the lowest consistent cost."

Following Mr. Stewart's address was the program of the "Table for Telexperts," which was one of the highlights of the 1943 convention and whose success was again repeated this year. This informative and interesting program was enthusiastically received. Conducting the program was Mr. Van Trine as interlocutor, with Mr. Boylan acting as judge. The experts were: Mr. Porter; John Cline, Southern Pines; Mr. DuRant, and Frank Barnes, Rock Hill, S. C. The experts

RALPH VAN TRINE

proved to be experts, indeed, as all the questions asked of them were answered.

At the final business meeting held in the Clubhouse, a demonstration of power interference on telephone lines was given by: J. W. Rimstidt, M. B. Wiley, W. C. Burnett and T. L. Milwee of the Southern Bell Telephone & Telegraph Co., assisted by C. R. Jones, transmission engineer of the Carolina Telephone & Telegraph Co. This demonstration was composed of a miniature power line and paralleling telephone line, with sub-station, oscillators, rectifiers and voltage control equipment associated with loudspeaking equipment to permit hearing of the noise induction by the audience.

The banquet held in the main dining room, with an attendance of 150, was an enjoyable occasion. R. M. Tucker, High Point, served as toastmaster. Music was furnished by an orchestra from a nearby Army air base. Edmund Harding of Washington, N. C., one of the South's finest humorist-musicians, an entertainment favorite of long standing with the North Carolina association, entertained with his jokes and squeeze-fiddle.

The concluding event was a dance held in the Clubroom.

V V

Buys Iowa Company

C. C. Pearce, manager, Farmers Telephone Co., Inc., Riceville, Iowa, announced November 27 that he has purchased the Lime Springs (Iowa) Telephone exchange from Edith F. DeWitt, widow of the late Maj. C. B. DeWitt (TELEPHONY, November 18, page 34), and will take possession January 1. Mr. Pearce said he plans to hire a manager for the Lime Springs exchange so he can continue as manager at Riceville.

TELETALK can save your subscribers miles of walking

Through the use of Teletalk Amplified Intercommunication, employes of the Murray Iron Works, Burlington, Iowa, are saved from fifty to 100 trips a day between their offices and the 600 foot-long foundry.

Among your subscribers are many progressive executives who are making plans for time-saving through up-to-date, convenient voice dispatching systems. You can increase the efficiency of their telephone service . . . increase revenue producing telephone calls . . . and add to profits by selling them Teletalk Amplified Intercommunication.

Whether a business occupies a city block or a two-suite office, there is a Teletalk system of just the size to make possible better contact between key individuals. Teletalk is easy to install . . . takes its power from the electric light circuit . . . requires practically no service.

Increase your revenue by calling the attention of your subscribers to Teletalk . . . the modern method of keeping in touch with every department of a business. Get in touch with us at once for full information.

WEBSTER ELECTRIC Teletalk

Licensed under U. S. Patents of Western Electric Company, Incorporated, and American Telephone and Telegraph Company

BUY EXTRA WAR BONDS

WEBSTER ELECTRIC CO., Racine, Wis., U.S.A. Est. 1909. · Export Dept.: 13 East 40th St., New York (16), N.Y. · Cable Address: "ARLAB" N.Y.C.

WEBSTER ELECTRIC

BERNARD
TRADE MARK REG.

LINEMEN'S PLIERS

STAND THE "DROP" TEST

The "Drop" Test

In this gruelling test, samples of Bernard Linemen's Pliers were chilled to 40 degrees below zero and then dropped from a building higher than the highest pole to a concrete surface below without breaking. It takes expert forging of superior steel to make pliers like this.

Equip your linemen with Bernard Pliers which stand the hardest usage and give

"More Power to You!"

Send for catalog of the Schollhorn line of BERNARD tools.

THE WM. SCHOLLHORN CO.
TELEPHONE TOOL DIVISION
420 Chapel St. New Haven, Conn.
Exclusive Makers of BERNARD Parallel Action Tools

Maintenance Practices

(Continued from page 20)

time the saturation of L_2 produces what might be termed an automatic tuning effect. A slight increase in condenser voltage is accompanied by a considerable ncrease in transformer exciting current, which reduces the effective capacity of the combination and thus tends to hold the voltage down. The converter thus is stabilized and it is possible to supply varying amounts of sub-harmonic power without stopping the oscillations.

The voltage across the condenser is mostly sub-harmonic, and when L_3 is omitted, or shorted, the output voltage has practically the same wave-shape as the condenser voltage. *Fig. 3a* shows an oscillogram of the output voltage supplied when L_3 is shorted. The 60-cycle input wave is superimposed on the oscillogram for frequency comparison, but a different voltage scale is used for the 60-cycle wave than for the 20-cycle wave. For ringing purposes, the wave shape shown in *Fig. 3a* is entirely satisfactory, but the harmonic content of the wave is low and the audible components of the voltage are weak.

In exchanges which feed back a portion of the ringing voltage to the calling subscriber to serve as audible ringing tone, the wave shape shown in *Fig. 3a* is not entirely satisfactory because of the lack of audible components. The small saturable inductance L_3, shown in *Fig. 2*, is added to introduce audible harmonics in the output voltage. The oscillogram of *Fig. 3b* shows the output voltage supplied when L_3 is in the circuit. This wave has appreciable audible components, evidenced by the short irregularity in the top of the wave. The audible components are sometimes further strengthened by connecting a small condenser (.05 to .5 microfarad) in parallel with L_3.

The ringing current is fed out through the series condenser C_1, which introduces a small voltage drop under normal resistive loads but protects the converter from overloads. Without this overload protection, the oscillations in the converter could be stopped by overloads. Of course the oscillations are rapidly restarted by the action of the relay, but if the overload would remain, the relay would continue to operate repeatedly until the protecting fuse opened or the overload was re-

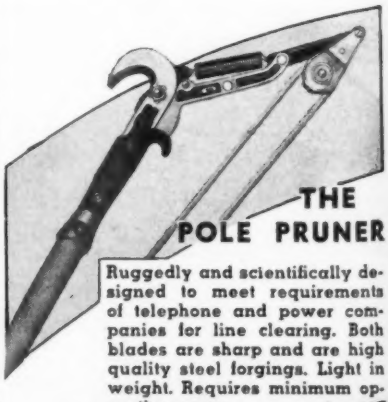
They are all
PORTER
CUTTING TOOLS
and yours for SPEED
LABOR SAVING
and SAFETY

STRAND CUTTER

Cut quick and all the way through — stranded guy wires, insulated wires and all types of cable. Lots of power, plenty of endurance and built with the precision of fine tool making. Be sure it is a Porter — HKP on the grips.

PORTABLE — POWERFUL

Every Porter tool is easily portable and operates independent of any power source except the hands of the user — Porter tools are *on-the-job-tools*—and their capacities start in where the ordinary one hand tool stops. You may know and use some Porter tools—but do you know the complete line and the broad range of models and capacities? There is a Porter tool for almost every cutting job—rods, cable, straps, barb wire, etc.



THE POLE PRUNER

Ruggedly and scientifically designed to meet requirements of telephone and power companies for line clearing. Both blades are sharp and are high quality steel forgings. Light in weight. Requires minimum operating power.

SEND FOR PORTER CATALOG
describing fully these and many other cutting tools.

H. K. PORTER, INC.
EVERETT, MASS.

moved. The insertion of condenser C_1 thus prevents excessive wear on the relay. In addition, the capacitive volt-amperes, provided by C_1 under load, provide some additional converter capacity when it is needed.

When the converter does not provide sufficient ringing power, it is ordinarily advisable to get a larger converter, but parallel operation of the converters is also practicable. In this case the input terminals of two or more converters are paralleled in the same polarity and the respective transformer secondaries are paralleled in the same polarity; the C_1 condensers will then also be connected in parallel with each other.

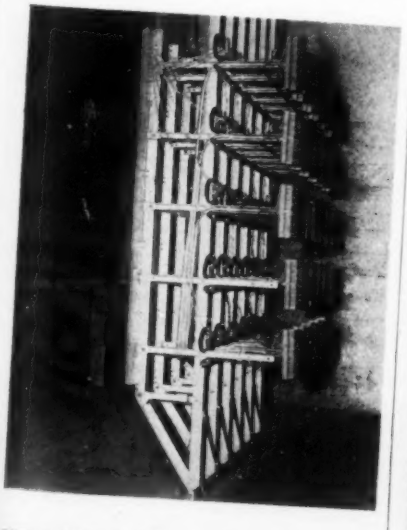
V V

Harrison, Ark., Independent Buys Bellefonte Company

The Boone County Telephone Co., Harrison, Ark., recently bought the Bellefonte (Ark.) Telephone Co., according to the announcement of W. J. Moore, manager of the Boone County company.

The Bellefonte company is a cooperative concern, and has maintained a switchboard at Bellefonte for several years. Mr. Moore said there are 26 telephones on the Bellefonte line, but that extensions and renewals of old subscribers will be made as materials are available.

At present, there are 1,317 telephones on the Boone County lines. This company is said to be the largest Independent company in the state.



TEST CORDS: Main frame test cords are usually a headache due to the fact that they must be long enough to reach each protector pair, consequently, they tangle easily. This objection may be overcome and the life of the cord greatly increased by taking care of the slack with a pulley arrangement as shown in the above photo. This arrangement is also convenient to use.

STROMBERG-CARLSON
RECOMMENDS—

PREVENT
Early Cable Discard by Eliminating

- SHEATH CUTTING
- CREEPING and
- RUSTING

With

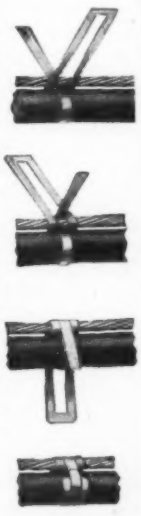
Reliable

ZINC CABLE HANGERS

Prolong the life of your cables at least for the duration—rehang them, although they may be badly worn, with Reliable Zinc Cable Hangers. All cable movement that results in wear and sheath cutting is eliminated. Added protection against lightning is provided—cable bound and solidly grounded to the messenger. Reliable Zinc Cable Hangers are strong, economical and easily installed. Request complete information and prices.

★

"RELIABLE" IDENTIFIES THE QUALITY



The four simple steps above clearly illustrate the simplicity of a Reliable Zinc Cable installation.

ANOTHER "HANDY DANDY" TOOL

MFD. BY CABLE SPINNING EQUIPMENT CO.

S&S Hand-Line Block

PROTECTS YOUR CABLE. WON'T SLIP.

NO WRENCHES NEEDED.

FOR USE ON BOTH SPUN CABLE AND CABLE IN RINGS.

ANOTHER TIME SAVING TOOL THAT PAYS FOR ITSELF.

STROMBERG-CARLSON — PROGRESS IN TELEPHONY

STROMBERG-CARLSON COMPANY

Factory and General Offices: Rochester 3, New York, U. S. A.
Branch Offices: Chicago, Kansas City, San Francisco, Toronto

HEMINGRAY INSULATORS

Favorably Known Since 1870

HEMINGRAY No. 10—*The exchange line pony with double groove. Standard on many telephone lines.*

Dependable—In Any Weather!

Hemingray Insulators are built to withstand *every* type of weather.

The exacting step-by-step quality production control makes them so tough and strong that sudden changes of temperature leave them unimpaired. They defy sun, rain, snow, hail and sleet.

One Hemingray user reports—*"thousands in continuous service for over 50 years".*

Hemingrays are sold by principal jobbers and are manufactured by Owens-Illinois, Hemingray Division, Muncie, Ind.

OWENS - ILLINOIS

HEMINGRAY INSULATORS

Telephone-Telegraph

Export Agents: International Standard Electric Corporation, New York City

THE OPERATOR'S CORNER

By MAYME WORKMAN

Traffic Supervisor, Illinois Telephone Association
Traffic Editor of TELEPHONY

TELEPHONE people are always out in front when it comes to lending a helping hand. Many telephone employes helped in the 1944 harvest.

A recent issue of *The Northwestern Bell,* Northwestern Bell Telephone Co. publication, carried an interesting story of telephone "Harvest Patriots" and their activities in harvesting "fighting food" on the broad and productive plains of South Dakota.

At the finish of the day's telephone job, over week-ends and during vacations, telephone men and women donned overalls or slacks and "rolled up their sleeves" to help the local farmers. They were a part of the huge volunteer farm labor corps which aided in harvesting the abundant and most important crops in history.

Quoting from the article appearing in *The Northwestern Bell:* "Representative of the volunteer farm helpers is Betty Blomster, a telephone operator in the Aberdeen, S. D., toll office. She is a shining example of the ideal farmerette with her glowing health, vivacious charm and boundless enthusiasm. Whenever a 'day off' comes along, Betty goes home to the large farm her father operates. This year her vacation days were purposely scheduled during the harvest season so she could ride the binder for her dad and do many other helpful jobs to relieve the manpower shortage.

"In answer to 'What do you do on the farm?' Betty's enumeration of activities seemed almost staggering. 'Oh, I milk the cows, feed the chickens, ride the binder, do the separating, make my own clothes, and lots of things. You see, I'm a 4-H'r, and that's all a part of my training. And then, of course, during the summer when the men are in the fields, we must take them lunch both in the forenoon and afternoon. There's always plenty to do and it's fun.

"'I enjoy my telephone work so much, and find that I can do my job better because the work on the farm not only relaxes me, but I get the necessary exercise, too'."

What a girl!

"Gladys Hall, an operator at Huron, S. D., said, 'Ours is a family-operated farm, we all help, down to my little 9-year-old sister. We call her our "water-monkey" because it is her job to carry water to us in the field. Sometimes she walks a mile or more to reach us, but more often she rides her pony.

"'We don't have a chance to get much sleep when harvest time arrives. We're up at 5:00 a.m. and complete the chores before sitting down to breakfast. Around 7:30 a.m. we're off to the fields and work until noon, when there is an hour's respite for lunch. Then back to the fields again. Upon our return, the evening chores are waiting for us. After eating supper and doing the dishes, it feels mighty good to sink into bed by midnight'."

Telephone men who responded to the call for volunteer farm work came in for their share of praise, too. According to these volunteer workers, "It was a good way to get our exercise. We like to get out and do this work. It's a change for us."

Some of the plant men's wives also joined the ranks of volunteer workers.

In conclusion, the article stated, in part: "The men and women who assisted in the farm work aided all of us right here in the telephone business. As one of the business men in South Dakota said, 'As farming goes, so goes business, too.' It was, then, of paramount interest to our company, and each of us, that the wealth of the harvest fields be carefully preserved."

We all have a feeling of pride in the accomplishments of our fellow workers in the telephone industry. "All for one, and one for all," is verily true in speaking of telephone men and women. We are all members of the great telephone fraternity which has established an enviable record of achievement in time of peace, as well as in time of war.

Questions from Illinois Operators

(1) On a collect call from California to a pay-station in Illinois, received during the reduced rate period in Illinois, but filed during the day period in California, what rate applies?

(2) When do you enter "hold for WH" on a ticket?

(3) On a station-to-station call, if you receive an NF report and the calling party specifies another residence, is the first ticket canceled?

(4) If NC is encountered at a tributary reached through another tributary,

do you leave MX precedence at the tributary office or at the toll center?

(5) On a collect call is it necessary to repeat the announcement to the called party if the first party who answers accepts the call?

The answers to these traffic questions are presented on page 96.

V V

Retires from Lincoln (Neb.) T&T With 46 Years' Experience

Claude L. Walker, since June, 1942, assigned to the Nebraska Ordnance Plant Exchange at Mead as equipment fireman, retired on October 1 from the Lincoln (Neb.) Telephone & Telegraph Co.

Mr. Walker first became interested in the telephone industry in Horton, Kan., in 1898, after spending a number of years as a railroad man. Shortly after, he moved to Hiawatha, Kan., where he was manager of the telephone exchange. In August, 1904, he moved to Beatrice and became associated with the former New Home Telephone Co. He became wire chief for that area, and later held positions as district inspector and maintenance inspector, helping plan and install many cable projects. He more recently participated in the conversion of exchanges from manual to dial operation.

The retiring employe was the guest of honor at a party held at Wahoo on September 27, attended by 25 friends and associates in the company.

C. C. Donley, general traffic superintendent, conferred a certificate upon Mr. Walker acknowledging his service record.

SWITCHBOARD CLOCK: The above picture shows a large clock installed on top of a multiple type switchboard in plain view of all the operators. This type of clock may easily be seen from a distance. Attention is also invited to the information directory arrangement mounted on the switchboard but within easy reach of all the operators.

Courtesy Pan American Airways System

"YANKEE" TOOLS

SPEED SERVICING!

Turn-around servicing of a Pan American Airways Clipper Ship is accomplished in 48 hours or less by a ground crew of 186 mechanics and inspectors . . . and "Yankee" Fine Mechanics' Tools help to speed and simplify this vital job. Designed to save time, trouble, and money, their inbuilt ingenuity is lengthening man-hours on the home front; their simplicity, strength, and compactness are upholding more than half a century's reputation for dependability. Order from your industrial supply distributor, or write North Bros. Mfg. Co., Dept. T-1244, Phila., Pa. Furnish priority ratings whenever possible, and every effort will be made to fill your orders.

"YANKEE" SPIRAL SCREW DRIVER No. 130A

"YANKEE" TOOLS

make good mechanics better

North Bros. Mfg. Co., Phila. 33, U. S. A.

Established 1880

WAC SUPERVISES DEPOT DIAL INSTALLATION

THE Holabird Signal Depot, Maryland, largest Army Signal Depot of its type in the world, recently installed dial telephones throughout. In charge of the change-over was WAC Lieut. Maltilda F. Foehr, Post Signal Officer. The lieutenant is believed to be the only WAC to have supervised the installation of one of the new type automatic switchboards.

During the months of August and September, a special team, headed by

(U. S. Army Photo)

Seated making a final check of the switchboard at the Holabird Signal Depot, just after the installation of a new automatic switchboard is DUNCAN M. HARRIS, Baltimore, Md., WAC LIEUT. MATILDA FOEHR, Post Signal Officer, who supervised the installation, and S/SGT. WILLIAM G. FOWLER, watching.

M/Sgt. Frank E. Hopkins, from Letterkenny Ordnance Depot, installed the system at Holabird because of the heavy traffic on the old one. Four telephone operators were handling 1,200 calls an hour on a peak load, or an average of five calls per second per operator.

At Holabird, where there are about 10 miles of cable and approximately 150,000 feet of telephone lines, thousands of calls must be made to carry out the normal functions of the depot. After the cut-over to the new system was made, Lieutenant Foehr found that there were very few complaints and that the system speeded up communications by about 50 per cent.

Lieutenant Foehr is the daughter of Mr. and Mrs. Roy Fagaly, Orlando, Fla. In civilian life, she was employed as a stenographer and bookkeeper in that city. She enlisted in the Women's Army Corps in October, 1942, and took her training at Ft. Oglethorpe, Ga. Her brother T/Sgt. Joseph J. Fagaly, is serving overseas.

V V

Takes Leave of Absence

R. N. HUNT of Highmore, S. D., who has been employed by the Central West Telephone Co. for over 12 years, recently took a six-months leave of absence and went to Phoenix, Ariz., for his health. Mr. Dirk of the company's Waverly, Minn., office has taken over Mr. Hunt's work.

DAMASCUS STEEL—famous for its toughness and temper—product of Syria's ancient capital. The sound of the hammers, as those old sword-makers forged their marvelous blades, echoes down the centuries. Until then the World had never known steel of such superlative quality.

Yet, today, Damascus steel wouldn't be in the running against the steel that modern Science has given to Vacuum Grip Pliers. A special formula high carbon molybdenum alloy — the climax of years of metallurgical research. Oil tempered. Hardened through and through in molten lead. The last word in steel toughness.

"STEEL" is why Vacuum Grip Pliers hold their cutting edges and sharpness of tooth over phenomenally long stretches of time—and why they are the pliers of long mileage and low cost.

LINEMAN PLIERS

An overcapacity pattern built for long life under severest service conditions.

FORGED STEEL PRODUCTS CO.
NEWPORT, PA.

Vacuum Grip Pliers

LENZ SWITCHBOARD CORDS

LOOK FOR LENZ THIS MARK OF QUALITY

OUR 40TH ANNIVERSARY

Rounds out 40 years of building quality Cords, Wires and Cables and a realization of our ambition to make the best product possible.

Answering the call to fulfill today's severest problems paves the way to serve you with better products tomorrow.

Sturdy tinsel conductors of LENZ Switchboard Cords protected by extra strong insulation insures perfect transmission longer. Lighter weight plus increased flexibility enable operators to easily handle peak traffic loads. Write today for complete information.

DISTRIBUTORS

LEICH SALES CORP.
427 W. Randolph St.
Chicago 4, Ill.

H. H. VAN LUVEN
307 E. 3rd St.
Los Angeles 13, Calif.

LENZ ELECTRIC MANUFACTURING CO.

1751 N. WESTERN AVE., CHICAGO 47, ILL., U. S. A.

"IN BUSINESS SINCE 1904"

Check Your Choice

of these "NATIONAL" Cable Specialties

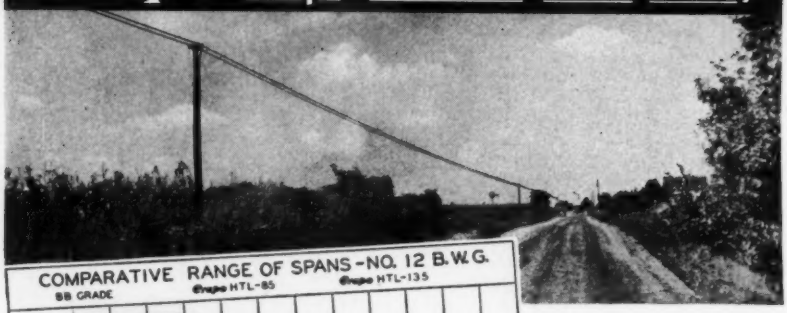
ALL SHOWN IN OUR BIG SUPPLY CATALOG

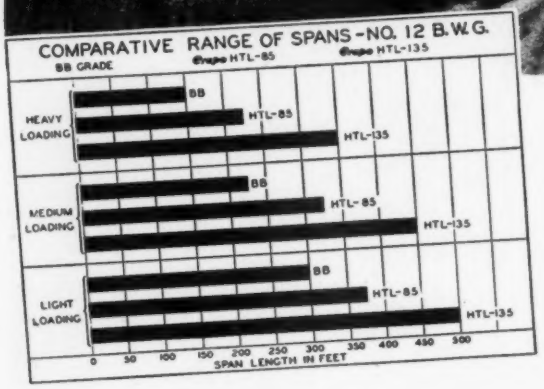
DISTRIBUTED BY

AUTOMATIC ELECTRIC
SALES CORPORATION

1033 WEST VAN BUREN STREET • CHICAGO 7, ILLINOIS

Save Poles by Specifying Crapo High-Tensile Line Wire!





Long Spans Conserve Material and Labor

You conserve materials, you save labor, when you use *Crapo* High-Tensile Line Wire for your open-wire circuits. Conservation of these items—always important in rural line construction—is more essential now than ever because of existing shortages.

Crapo HTL-135, with two and one-half times the tensile strength of standard B.B. wire, makes possible spans to 350 feet in heavy, 450 feet in medium and 500 feet in light loading areas. This means that the number of poles per mile in the heavy loading district may be reduced to approximately 15, a saving of more than one-half the number ordinarily required where B.B. wire is used.

Crapo HTL-85, with 60% greater strength than B.B. wire, provides for spans of 225 feet in heavy, 325 feet in medium and 375 feet in light loading districts. The number of poles per mile, in heavy loading areas, need not exceed 24 where *Crapo* HTL-85 is employed in long spans.

Because of their rugged strength, *Crapo* HTL-135 and *Crapo* HTL-85 Line Wires provide a greater factor of safety, minimize service interruptions and reduce maintenance costs. Both wires have superior telephonic transmission characteristics.

• • • •

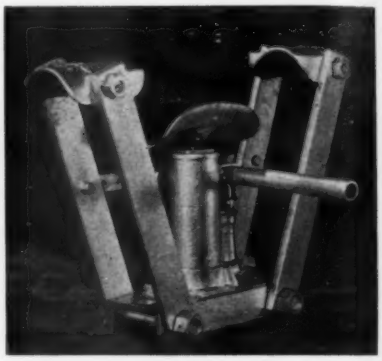
Write for Technical Information!

Now—and in your planning for the future—weigh the outstanding practical advantages of *Crapo* High-Tensile Line Wire! Write to-day for Bulletins No. 201 and No. 202 containing sag and tension data and construction practice information. Or, contact your distributor of *Crapo* Galvanized Telephone Wire and Strand.

INDIANA STEEL & WIRE COMPANY · MUNCIE, INDIANA

New Hydraulic Cable Bender Designed

Telephone men admire neatly formed cables racked in a manhole or cable vault. Those who have, at one time or another, tried their hand at racking cable realize that it is a difficult job. Various types of cable benders are now available which provide varied degrees of satisfaction. The bender which is in more general use at the present time, consists of a steel frame equipped with three, curved shoes and is operated by a rack and pinion. The pinion gear, which is turned by means of a wrench or crank, moves the rack to which the middle shoe is attached. This action presses the cable between the two outer shoes and bends it to the desired angle.



New cable bender designed by cable splicer and inventor.

The Transmitter, published by the Chesapeake & Potomac Telephone Co., Washington, D. C., recently described a new type of cable bender which has been perfected by Bernard L. Gordon, cable splicer and inventor. This new tool permits the cable to be bent and formed with much less effort than possible by the use of any cable bender previously available. This is accomplished by employing a hydraulic cylinder and hand lever to actuate the middle shoe. In addition, the two outer shoes have been mounted on arms which are adjustable. The preliminary model of the new tool is shown in the accompanying photograph.

V V

Appoints Assistant Manager

C. L. KELLEY, general manager of the Farmers Telephone Co. of Dodge County, Neb., recently announced the appointment of H. C. CUSACK of Fremont as assistant manager. Mr. Cusack is a former resident of North Bend, the headquarters of the company, and as a civil engineer was engaged in building the Alcan Highway for the federal government. Mr. Kelley said the appointment was necessary because of increased duties.

Lead-Eater Annoys Marine Telephone Linemen

For a little guy, Scobicia Declivis is plenty rugged. He eats lead. He chews it up and swallows it, or he chews it up and spits it out, as the occasion may demand. He gets neither lead poisoning nor indigestion.

Three Marines at Camp Pendleton, Calif., in fact, are unappreciative of Scobicia's peculiar talents. They are responsible for the maintenance of the communications system of this big military reservation. Scobicia, on the other hand, is responsible for chewing holes in it.

Scobicia Declivis is a genuine, no-punches-pulled, lead-eating beetle. He measures about one-fourth of an inch from stem to stern and about one-tenth of an inch across.

His favorite diversion, it seems, is to chew a neat hole in the lead covering of a field telephone wire somewhere within the camp, preferably near the top of the highest, most distant, most rugged mountain. Then he—or rather, Mrs. Scobicia—crawls within, lays her eggs and departs.

That in itself is annoying, because it produces scratchy overtones to the conversations of colonels and privates alike. But it is not the end of the story. For the rains, even in Southern California, must come. And when they do, the water pours through the holes, shorts the wires, and disrupts communications.

Tech. Sgt. Willard E. G. Dice, Los Angeles, is the man most bothered by Scobicia's gastronomic gyrations. Sergeant Dice is the non-commissioned officer in charge of the camp's three telephone linemen. He sees nothing funny in Scobicia's habits. Neither do his two assistants, Sgt. Robert W. Gamble, Omaha, Neb., and Pfc. Harold James Huber, Crestline, Ohio.

But Scobicia, who, scientists say, arrived in this country via lumber or furniture shipments from a far-away land, is not perturbed by their lack of humor. He's too busy. He still has 28 miles of the camp's telephone lines to go.

V V

Sees Battle from Palm Tree

Pvt. William Nykaza of Chicago was high in a palm tree on Leyte, P. I., stringing telephone wire when the Japanese counter-attacked. He stayed aloft while they took the position, and also stayed there while Americans took it back. Said Private Nykaza: "I had a 50-yard-line seat."

CONDUIT CONSTRUCTION: When this war is won it seems certain that many telephone companies will expand to such an extent that underground conduit and cable construction will be necessary. Various types of approved conduit will be available, all of which will be found entirely satisfactory, when installed in accordance with standard practices. The above photograph shows single cement-asbestos conduit installed in multiple. This is the thick-walled variety which may be safely installed directly in the earth without a concrete encasement. The installation shown in the attached photograph has concrete protection at the joints only.

SOLVE

Ringing problems of Selective Party Lines

The Holtzer-Cabot alternating-current motor-driven multi-frequency set is designed for supplying suitable frequencies of alternating current for selective party lines. Simple and foolproof, these machines give long-lived performance with minimum attention and maintenance. They are available in 50 and 150 watt outputs. Four frequency generators have an output of 16.6, 33.3, 50.0, 66.6 cycles at 75, 100, 135, and 175 volts respectively. Five frequency generators are the same as above with the addition of 25.0 cycles.

Investigate Holtzer-Cabot telephone ringing equipment for your exchanges. It has the unqualified approval of the engineering and service departments of all major telephone companies. Bulletin 1310-02 gives the complete Holtzer-Cabot story.

HOLTZER-CABOT
Division of First Industrial Corporation
Designers and Builders of Special Fractional HP Motors and Electrical Apparatus

125 AMORY ST., BOSTON 19, MASS. 6161 SO. STATE ST., CHICAGO 21, ILL.

COFFING HOISTS

When full construction and maintenance can be resumed you will want it accomplished quickly and economically. Coffing hoists and utility maintenance tools will assist you in doing those "back-breaking" lifting and pulling jobs with an ease and sureness that will save you many man hours.

In your post-war plans be sure to include a "Safety-Pull" ratchet lever hoist for every truck.

Write Today for Catalog TG-6

FOR SPEED
SAFETY
ECONOMY
DURABILITY

IN PRACTICALLY ALL LINES OF INDUSTRY COFFING HOISTS ARE PLAYING A PROMINENT PART IN SPEEDING UP
CONSTRUCTION
PRODUCTION
MAINTENANCE

COFFING HOIST COMPANY
Danville, Illinois, U. S. A.

COURTS AND COMMISSIONS

Michigan Associated Company To Defend Rate Structure

Having ordered rate reductions or rebates totaling approximately $15,000,000 for customers of several large Michigan utilities, the Michigan Public Service Commission on December 1 opened an inquiry into rates charged by the Michigan Associated Telephone Co., which serves about 13 counties through exchanges in Muskegon and eight smaller Michigan cities. (TELEPHONY, October 28, page 24.)

Gilbert T. Shilson, commission chairman, implied this would be the last investigation of a series involving excess profits tax liability of utilities when he said no other Michigan utilities had sufficient excess profits tax liability to warrant hearings or rate adjustments.

Chairman Shilson said the Michigan Associated company has been ordered to make an appearance December 8 to defend its rate structure.

V V

Forest Park Subscriber Sues Illinois Bell

The telephone operator slept while her home at Grass Lake, Ill., burned down last February 1, Mrs. Elizabeth K. Loos, Forest Park, Ill., charged November 29 in a suit for $6,000 against the Illinois Bell Telephone Co., in Superior Court.

Between 2 a.m. and 4 a.m. on that date no one could awaken the operator, the suit declared, and when a messenger finally brought the Fox Lake Fire Department from 3½ miles away, it was too late.

V V

Northwestern Bell Applies for Revision of Limitation Regulation

The Northwestern Bell Telephone Co., Omaha, Neb., recently applied to the Nebraska State Railway Commission for authority to revise its "limitation of service offering" regulations, partly to conform to the WPB's U-2 directive.

Where the use of a telephone by a subscriber interferes with and impairs the general service, the company may require that additional service, adequate for the purposes of the subscriber, be installed or may discontinue service entirely. The system of priorities adopted are just for installations essential to the protection of life, changes of address by business subscribers, change of address by residential subscribers, new business stations and then new residence stations.

V V

NWLB Authorizes Hourly Wage Increases Up to 50 Cents

Revised General Order No. 30, dated November 17, issued by the National War Labor Board states that voluntary wage and salary increases can now be made up to 50 cents an hour without obtaining NWLB approval. The order reads as follows:

"**General Order No. 30**—In accordance with the provisions of Section 4 of Title II of Executive Order 9250, increases in wage or salary rates which do not bring such rates above 50 cents per hour may be made without the approval of the National War Labor Board. Increases above 40 cents per hour made hereunder may not, however, furnish a basis either to increase price ceilings of the commodity or service involved or to resist otherwise justified reductions in such price ceilings."

V V

Rockford, Ill., Petition Asks Reduced Telephone Rates

A reduction of local telephone rates was asked in a formal petition filed December 1 by the city of Rockford, Illinois, with the Illinois Commerce Commission.

Signed by Mayor C. Henry Bloom, the telephone rate petition cited a Federal Communications Commission report indicating that the Illinois Bell Telephone Co. during eight months ended August 31 made provision for federal excess profits taxes amounting to $2,934,975. (TELEPHONY, November 25, page 33.) The petition asks that the telephone company be required to show cause why there should not be a reduction in rates for intrastate telephone service rendered in the city of Rockford.

V V

Commission O.K.'s Higher Rates And Sunday Service Suspension

The Hammond (Minn.) Telephone Exchange on November 27 was permitted by the Minnesota Railroad & Warehouse Commission to put into effect the proposed rates and charges for service as applied for on November 9. (TELEPHONY, November 25, page

SPECIFY G-E Telephone Wire

For Easy Installation

Dependable G-E Telephone Wire made to rigid G-E specifications is fast gaining many new users throughout the telephone industry. An alloy-coated copper used in its manufacture makes this wire easy to bend and form. Connections are simple and quick. G-E Telephone Wire is available in two- or three-conductor assemblies. It has a glazed cotton finish for indoor use and a heavy braid, mica-flake, weatherproof finish for outdoor use.

For more information, write to Section W-1242-4, Appliance and Merchandise Dept., General Electric Co., Bridgeport, Conn.

BUY WAR BONDS AND KEEP THEM

Hear the General Electric radio programs: "The G-E All Girl Orchestra" Sunday 10 P.M. EWT, NBC. "The World Today" news every weekday 6:45 P.M. EWT, CBS.

GENERAL ELECTRIC

GARY SERVICES AND INVESTMENT COMPANY

(A Wholly-Owned Subsidiary of Theodore Gary and Company)

Hunter L. Gary, Chairman — **A. F. Adams, President**

Executive Committee

A. F. Adams
E. C. Blomeyer
Hunter L. Gary
F. S. Spring
W. F. Benoist
V. E. Chaney
G. L. Grawols

Head Office: 1100 King Street, Wilmington 33, Delaware
A. E. Carlson, Secretary

The Washington, D. C. office of this company under the direction of Howard A. Burroughs, Manager, services the National and International needs of companies in the Gary Group in connection with their wartime duties and postwar activities in the communication industry. In addition to rendering service to companies in our Group, Mr. Burroughs will be glad on request to give friendly assistance and cooperation in Washington to friends and customers of the various companies in our Group.

HOWARD A. BURROUGHS, Manager, Washington Office

GARY SERVICES AND INVESTMENT COMPANY

Munsey Building — **Washington 4, D. C.**

Telephone: Executive 6955

33.) The company was also authorized to suspend service between the hours of 12 o'clock noon and six o'clock in the evening on Sundays and legal holidays.

The new rates were ordered to become effective upon the first billing date following December 31. The suspension of service is to be effective January 1, 1945, and continue until such time as it may be modified by further order of the commission.

At the hearing it was found that the Hammond company serves 14 local and 106 rural stations in the county of Wabasha. The book cost of the telephone property useful in rendering service was found to be $9,507.

V V

Mutual Absorbs Small Company

The property of the Deal & Hunt Telephone Co., Batesville, Ohio, having been purchased and now being operated by The Batesville Telephone Association, Inc., a non-profit organization, has had its name stricken from the list of public utilities operating subject to the Ohio Public Utilities Commission's jurisdiction.

V V

D. T. Swanson Leads in Nebraska

Although the official count of the November election in Nebraska awaits the tabulation of soldier votes, the large lead given DUANE T. SWANSON, chairman of the Nebraska State Railway Commission, who is just finishing his first term, insures his re-election. His Democratic opponent, WILL M. MAUPIN, a former commissioner, led his party ticket, but the Republican landslide buried him.

MRS. ROSE McCARTHY (left) and MRS. LEOTA BARGER, veteran employes of the Illinois Central Telephone Co., Clinton, were honored recently at a party of company employes, where they were presented with 25-year buttons and life memberships in the Telephone Pioneers by the company. Mrs. McCarthy started her telephone career October 2, 1917, at Sullivan, Ill., with the National Telephone & Electric Co., later the Illinois Central company. During her 27 years with the company, Mrs. McCarthy has served as local, long distance and chief operator, later being transferred to the commercial department as cashier and bookkeeper which position she now holds. Mrs. Barger also began with the National company at Sullivan as local and long distance operator, later being promoted to chief operator, her present position. She is a ticket clerk in the business office, in addition to her chief operator's duties.

V V

Summary of Commission Rulings and Hearings

Federal Communications Commission

November 24: Granted temporary authority to American Telephone & Telegraph Co. to operate in private line (teletypewriter) service a line between Shepardstown, W. Va., to Charles Town, W. Va., from November 25 through December 20, 1944.

November 25: Granted special permission to American Telephone & Telegraph Co. to amend tariff FCC No. 204, effective December 15, on not less than one day's notice, to provide for the offering to the public of message toll telephone service between points in the United States and Douglas, Elmendorf Field, Fort Richardson and Thane, Alaska.

November 27: Granted special permission to American Telephone & Telegraph Co. to amend tariff FCC No. 208, effective on not less than one day's notice, to provide interexchange channels for 60-speed private line teletypewriter service at Guadalupe, Calif., a non-Bell company exchange.

Illinois Commerce Commission

December 5: Hearing on proposed rules, regulations and conditions of service in Dorchester and vicinity as stated in schedule rendered by Dorchester (Ill.) Telephone Co.

December 6: Hearing on proposed

ENDURANCE

TELEPHONE WIRES

Rubber and Plastic Insulation

Drop (Bronze, Copperweld, Copper or Iron)

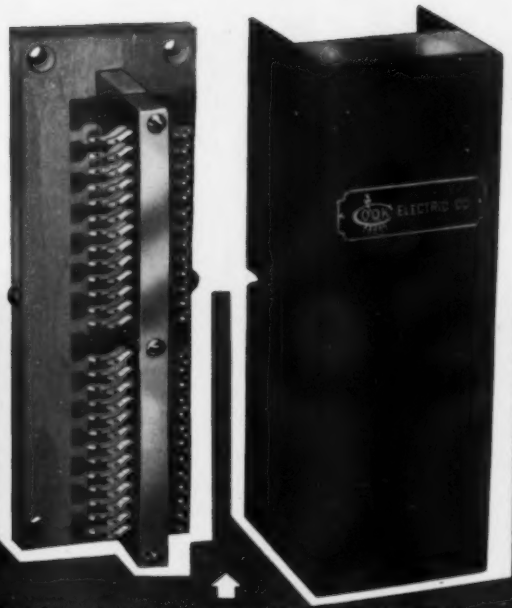
Bridle, Interior, Duct, Fixture, Tree, and Ground

GENERAL INSULATED WIRE WORKS, INC.

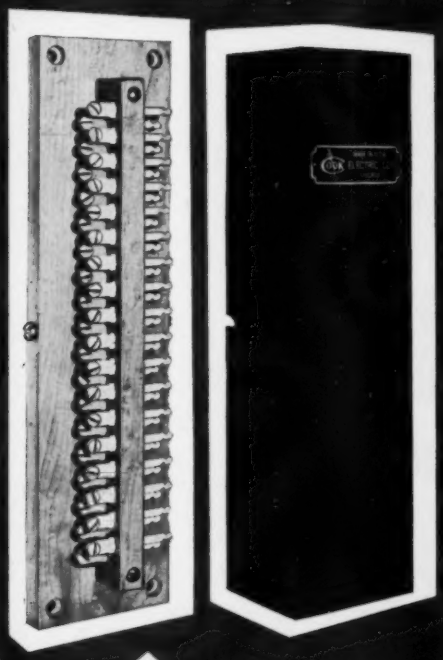
69-105 GORDON AVENUE • PROVIDENCE 5, R. I.

TELEPHONE—HOPKINS 2100

COOK INTERIOR JUNCTION BOXES



The Type 52 meets the need for compactness, convenience and low cost for the termination and distribution of inside cables in P.B.X. installations, small unattended exchanges and floor cable distribution in factories, offices, stores, institutions, etc.



The Type 54 is similar to the Type 53, except that heads are smaller, the unit is more compact and has lighter weight studs. It is especially designed for the distribution of enunciator wire in small P.B.X. systems.

The Type 53 is for use in P.B.X. installations, small unattended exchanges and floor distribution of cables in factories, offices and stores where screw connections for drop wires and economy are desired.

Reach for your Cook catalog for full information on all products of the Cook line—the best line for your lines.

COOK ELECTRIC Company

Telephone Protection & Distribution Engineering Since 1897

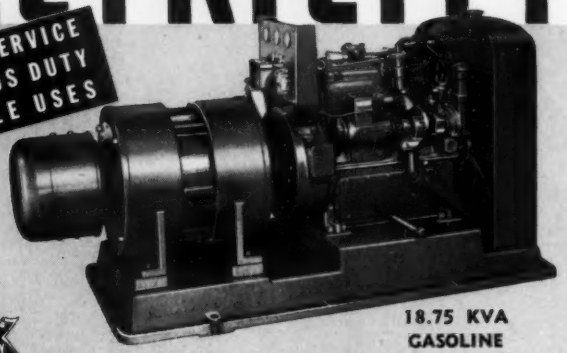
2700 SOUTHPORT AVENUE

•

CHICAGO 14, ILLINOIS

ELECTRICITY

for STAND-BY SERVICE
CONTINUOUS DUTY
PORTABLE USES



ARMY E NAVY

18.75 KVA
GASOLINE

UNITED STATES MOTORS CORP.
556 Nebraska St.
OSHKOSH, WIS.

More and more telephone companies are installing stand-by electric plants to insure uninterrupted service. We are supplying many of these plants. Already there are well over 1000 U. S. stand-by units throughout the world at vital radio and communication centers. U. S. Electric Plants are now available on AA3 priority or better. Write for details.

U.S. Electric Plants

GASOLINE • KEROSENE • DIESEL

CLEARS TROUBLE IN A HURRY

Averages $6.00 Saving Per Fault

This easy-to-use Wheatstone Bridge puts its finger on faults — locates grounds, crosses or opens — enables trouble-shooters to clear lines or cables in minimum time.

A recent survey among users indicates that this Test Set saves from 1 to 8 hours in locating faults, as compared with other methods. In terms of man-hour cost of trouble-shooting, it saves an average of $6.00 per fault. From this average figure, it appears that after locating 21 faults the instrument has saved enough to pay for itself. After its 21st location, this test set is actually earning money.

These savings, as well as the benefits of subscriber good-will are yours with the purchase of one of these Test Sets. Price is $125.00. If more information is required, write for Catalog E-53-441(1).

A FREE HANDBOOK explaining methods of using this Bridge for locating grounds, crosses, opens and other faults, will be sent on request. Write for Note Book E-53-441 "Notes on Fault Location in Cables."

5430-A Type U Test Set

LEEDS & NORTHRUP COMPANY, 4901 STENTON AVE., PHILA. 44, PA.
LEEDS & NORTHRUP
MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

Jrl. Ad. E-53-441(4a)

advance in rates of Flanagan (Ill.) Telephone Co. as stated in schedule rendered by said company.

Indiana Public Service Commission

November 10: Hearing on application of Turman Township Telephone Co., Graysville, for increased rates.

November 14: Hearing on application of Farmersburg (Ind.) Telephone Co. for authority to issue mortgage notes to secure money to repay indebtedness and purchase new switchboard.

November 28: Hearing on application of Bellmore (Ind.) Switchboard Co. for authority to purchase and/or sell telephone exchange, including properties and franchises in Bellmore, and for authority for corporation to own and operate telephone plant there.

November 29: Hearing on application of Falmouth (Ind.) Mutual Telephone Co. for increased rates.

November 30: Hearing on applications of State Line Telephone Corp. and Indiana Western Telephone Corp. for authority to issue and sell common stock and first mortgage bonds.

Kansas State Corporation Commission

December 12: Hearing on application of Ross Gault of Glen Elder (Kan.) Telephone Co. for authority to make certain changes in rates.

December 12: Hearing on application of Farmers Mutual Telephone Co., Wellington, for authority to make certain rate changes for service at Wellington and South Haven.

December 12: Hearing on application of L. G. Elmore, owner, Longton (Kan.) Telephone Exchange, for permission to transfer franchise and cease operating.

December 12: Hearing on application of B. B. Strieby for certificate of convenience and authority to transact telephone business at Longton and trade territory.

Ohio Public Utilities Commission

December 19: Hearing on application of Ohio Standard Telephone Co., Jackson, for authority to increase rates in Sardinia, Mowrystown, Felicity and Hamersville.

Wisconsin Public Service Commission

December 4: Hearing on investigation of rates, rules and practices of Wilson Telephone Co., Sheboygan.

December 8: Hearing on application of Elroy (Wis.) Telephone Co. for authority to increase rates.

V V

Elect R. G. Roadstrum President Of Intra-State Company

At a meeting of the board of directors of the Intra-State Telephone Co., Galesburg, Ill., recently, R. G. Roadstrum was elected president to fill the vacancy left by the death of F. C. Woods. (TELEPHONY, October 21, page 116.)

Mr. Roadstrum has been a director of the company as well as secretary and general manager for several years. Aside from the presidency he will retain his duties as general manager.

Bulletin

TO ALL TRUCK OPERATORS AND FLEET OWNERS

FWD Trucks Available for Civilian Purchase on and after Jan. 1, 1945

GOOD NEWS—FWD four-wheel-drive trucks, pre-eminent in war services, with production previously restricted almost exclusively for the military, are soon to be available for motor transport, highway, utility, oil fields, and other essential civilian services.

Recent directive from the WPB provides for production of a substantial number of FWD trucks in a wide variety of models and types, 2½ to 15 tons capacity; such trucks to be built only for essential civilian uses. FWD trucks built under this release will be available for purchase on and after January 1, 1945. Deliveries will be made in keeping with priority of orders as received; immediate action and prompt placing of orders is urgent to assure delivery before limit of production is reached.

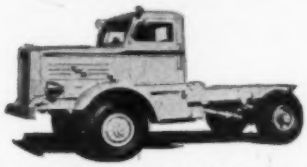
Write — wire — or phone us directly, or the nearest authorized FWD dealer for full information and your eligibility to purchase under these new rationing regulations.

FWD TRUCKS

THE FOUR WHEEL DRIVE AUTO CO.
Clintonville, Wisconsin
Canadian Factory: KITCHENER, ONTARIO

These and other FWD Trucks, 2½ to 15 ton capacity, available to qualified purchasers.

Straight trucks in FWD's "H" series range 17,000 to 20,000 lbs. gross vehicle weight capacity with wheelbases from 144" to 154" gasoline engine powered with power plants from 100 to 120 hp and with four-wheel drive.



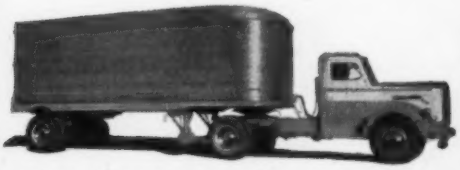
"M" series FWD's powered with either gasoline or diesel engines ranging from 150 to 200 hp and with capacities ranging from 30,000 to 42,000 lbs. gross vehicle weight. Four wheel drive.

"U" series FWD's with gross vehicle weight capacities of 22,000 to 28,000 lbs. Powered with 125 hp gasoline engines, 5 speed transmission, 11:00x20 tires, wheelbase 150". Four wheel drive.

FWD's four-wheel drive Road Maintainer — built for underbody scraper use with extra heavy frame and other features that make it the ideal unit for street and road maintenance. Engine 115 hp — 5 speed transmission — 8:25x20 dual tires.

Utility Line Construction and Maintenance trucks by FWD with 5 and 7 man cabs, special power-take-offs and line bodies. Powered with 115 hp engine on 144" wheelbase with four-wheel drive, 5 speed transmission, 144" wheelbase and 9:00x20 tires.

Six-wheel drive FWD trucks with gross vehicle weight capacities of 55,000 lbs. Powered with either gasoline or diesel engines of 150 and 200 hp. Wheelbase from 214½" to 276".



FWD's "H" series tractor trucks with four-wheel drive and gross vehicle weight ratings from 40,000 lbs. to 60,000 lbs. Powered with gasoline engines ranging from 100 to 120 hp on wheelbases from 120" to 144" in conventional or cab-over-engine types.

New York Telephone Company Hires Negro Operators

It is reported that 26 Negro switchboard operators were employed by the New York (N. Y.) Telephone Co. beginning December 4. By its action, the company became the first in any major city to hire Negro operators, it is said, a step which Negro leaders hailed as one of importance to their people.

Malcolm Ross, national chairman of the President's Committee on Fair Employment Practice, said the company's employment plan "represents the satisfactory and fruitful adjustment of complaints filed recently." A company spokesman said, however, the hiring of Negroes was not the result of FEPC action but in line with company policy.

V V

Repairman on Service Call Finds Fire, Summons Help

Frank Kuchera of the Lincoln (Neb.) Telephone & Telegraph Co. Service Department recently was out on an "install" looking for a certain address. He thought he knew the house, so scarcely glancing at the address, he rapped gently on the front door. Receiving no response he asserted himself more firmly but still no one stirred. At this juncture, the unmistakable odor of burning wood wafted through the portal and, peering inside, Mr. Kuchera could see curling wisps of smoke.

After hurried calls to three neighbors, he found one at home, and the fire department was summoned in time to extinguish the blaze before more than slight damage was done.

When the excitement had subsided, Mr. Kuchera looked at the house number with a more discerning eye and discovered he had the wrong house all along, which undoubtedly, was a most fortunate circumstance.

V V

Rural Development Drive Planned By Northwestern Bell

Officials of the Northwestern Bell Telephone Co., Omaha, Neb., announced recently that a special drive to secure rural subscribers will be inaugurated as soon as war regulations permit. During the last 11 months the company has added 3,740 rural stations, due to a relaxation of some wartime restrictions.

The rural development in the states of Nebraska, Iowa, Minnesota and the Dakotas, where the company operates, is the second highest in the country. In Nebraska 46.8 per cent of the farmers in the company's territory have telephones. In one area, Colfax County, the percentage is 56.8.

V V

Kansas Independent Sold

Sale of the Overbrook (Kan.) Telephone Co. was announced November 9 by H. E. Baker, who has owned and operated the exchange for the past 39 years. Willard Cobb of Wichita, Kan., is the new owner. He also owns the Cobb Telephone Co., Piedmont.

COMING TELEPHONE MEETINGS

Minnesota Telephone Association, St. Paul Hotel, St. Paul, January 23, 24 and 25, 1945.

Texas Telephone Association, Baker Hotel, Dallas, March 12 and 13, 1945.

Kansas Telephone Association, Hotel Kansan, Topeka, March 15 and 16, 1945.

Kentucky Independent Telephone Association, Lafayette Hotel, Lexington, March 20 and 21.

Iowa Independent Telephone Association, Hotel Fort Des Moines, Des Moines, April 3 and 4, 1945.

Nebraska Telephone Association, Hotel Lincoln, Lincoln, April 5 and 6, 1945.

Spring Executives' Conference of the United States Independent Telephone Association, Edgewater Beach Hotel, Chicago, April 10 and 11, 1945.

Illinois Telephone Association, Hotel Pere Marquette, Peoria, April 19 and 20, 1945.

Ohio Independent Telephone Association, Deschler-Wallick Hotel, Columbus, April 24 and 25, 1945.

Tennessee Independent Telephone Association, Nashville, March 23, 1945. Hotel not yet decided.

Indiana Telephone Association, May 9 and 10, 1945. City not yet decided.

Pennsylvania Independent Telephone Association, Hotel Lawrence, Erie, May 22, 23 and 24, 1945.

SANTA CLAUS HIMSELF MAY HAVE TROUBLE THIS YEAR,

but we will be able to take care of your directory problems now or any time even if you are short of experienced help.

We have been fortunate in retaining a staff of experienced salesmen who are above the draft age.

If we are not now handling your directory, it will be to your advantage to have our Company do this work.

Our men have been trained in understanding how to handle the public so that every contact builds up and maintains good public relations.

Write or Telephone for Complete Information.

L. M. Berry & Company

DAYTON, OHIO
L.D. Loop 16—ADams 4127

Serving Telephone Companies in over 3,000 Cities and Towns

Canadian Branch: L. M. Berry & Co., Limited
Winnipeg, Canada

Dehumidifying Switchrooms

(Continued from page 64)

the appearance of being part of the general switchroom equipment.

At the start of new construction, it was apparent that the buildings in which the air conditioning units were to operate were not insulated to prevent heat transfer loss. This factor was not considered serious and, in fact, became an asset, because the object was to remove the moisture from the air, not to refrigerate the rooms which were reasonably air-tight to exclude the entrance of damp, outside air. Steel sash windows were used and sealed tight, which helped keep out dusty air in many locations.

Offices which are constructed with hollow glass block are ideal. Fresh air is admitted to the conditioner by means of a controlled air damper, but additional air is, of course, admitted by passage of personnel through the building doors. Installations have been successfully made for one and two floor offices. The one floor installations are arranged to throw the dry air as high as possible the long way of the room. Ceiling heights average 12 ft. Some are smooth, some beamed, and one is arched to a height of 18 ft. above the floor. In the two floor installations, all buildings were identical. The main frame, power board, charging equipment, storage battery and wire chief's test desk were on the ground floor in one room, and above this room on the second floor was the switchroom and attendants' cabinet room.

In every case, the air conditioner is located in the air conditioned area rather than in an outside room, which facilitates recirculation of the cooled and dried air, resulting in a marked reduction of running time for the unit, and, at the same time, the air is cleaner, resulting in less dust collecting on the filters. Circulating water for the compressor is taken directly from the water mains, with only enough water allowed to flow to keep the compressors properly cooled. It is possible to install small water condensing units where water must be saved; however, under normal operation, the water flow compressor stops.

Conversely, should the water fail, the compressor "head pressure" builds up sufficiently to operate a high pressure "shut down" circuit breaker, which will automatically reset when the pressure condition is again normal due to the resumption of water flow. If it is desired, the unit fan can be operated without refrigeration to circulate the room air, but normally the unit functions with both fan and refrigeration running together. The fan does not shut down at any time other than by manual control, but the refrigeration unit runs under direct control of a variable temperature "cold control" switch on the unit, which is set to maintain an average room temperature of 78 degrees, being approximately seven degrees cooler than the outside air.

The action of a dehumdifying unit is very similar to a glass of cold water in warm, humid summer air. The cold glass condenses water from the air which appears on the outside of the glass in the form of moisture beads that constantly run down the side of the glass. In the air conditioning unit, the warm, moist air is forced over cooling coils refrigerated with freon gas. The chilling of the air below its "dew point," as it passes through the cooling surface, accomplishes the dehumidifying process.

Excess moisture in the air is condensed out and drained away as it falls from the fins and tubes into a drip pan. The air is cleaned on its

DRIERITE

The Modern DESICCANT FOR DRYING CABLE SPLICES

DRIERITE dries the Cable Splice by positive absorption of all moisture from wires, insulation, bandage and surfaces inside the sleeve. Application is easy and rapid.

The snow-white granular **DESICCANT** is neither poisonous, corrosive nor abrasive, and does not evolve gas, fume or odor either in storage or in use. It eliminates all chance of fire, accident or discomfort to workmen or occupants of buildings.

STANDARD PACKAGES

1/8 Pint Can (50 grams) 48 per Carton.
1/2 Pint Can (200 grams) 12 per Carton.
1 Quart Can (800 grams) 12 per Carton.

For sale by the Manufacturer and leading telephone supply houses.

W. A. HAMMOND DRIERITE COMPANY
XENIA, OHIO

Use of Vacuum Tubes in Telephone Work Is Increasing. Learn About Them From

FUNDAMENTAL ELECTRONICS AND VACUUM TUBES

By ARTHUR L. ALBERT
Professor of Communication Engineering, Oregon State College

Discusses the principles of electronics and the theory of vacuum tubes, photocells and copper-oxide varistors in radio and in telephone circuits. Stresses both the theory of these devices and the design and operation of circuits in which they are used. The book is non-mathematical and of practical value to those in engineering and operating branches of telephony.

422 Pages — 6 by 9 in. — $4.50

TELEPHONY PUBLISHING CORPORATION
608 S. Dearborn St., Chicago
WABash 2435

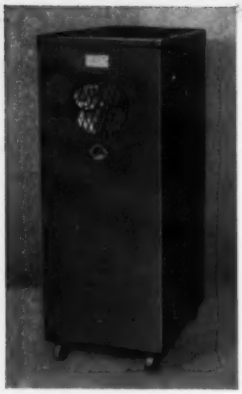
way to the cooling unit by passing through a renewable filter material of spun glass, coated with a sticky substance which catches and holds the dust, dirt and pollen. These filters can be cleaned several times and are inexpensive to renew.

It has been possible to keep the relative humidity in all automatic switchrooms down to an average of 60 per cent throughout the year without overrunning the machines. As an aid for holding the humidity down, each machine has a 3,000 watt heater installed in the plenum chamber which is turned on and off by a hygrostat mounted on a wall some distance away from the unit. These hygrostats, which are adjustable for any desired setting, have been calibrated and set for 60 per cent relative humidity. Thus, when the room humidity near the hygrostat rises above 60 per cent, the control turns on the plenum chamber heaters to warm the air being delivered to the room; as soon as the humidity falls below 60 per cent, the hygrostat shuts off the heater.

In buildings equipped with steel sash, glass windows or hollow glass block walls, the heat received through the glass from the outside provides sufficient "back heat" to keep the hygrostats from turning on the heaters. On very cloudy days, of which there are many during the long rainy season, the hygrostat controls frequently, while at night the heaters come into operation for approximately 10 mintues during every hour. This "back heat" control is necessary in buildings which have no windows or openings to the outside heat of the day, because, without the "back heat," furnished by the electrical heaters, it would be necessary to lower the room temperature to a point uncomfortable for personnel if proper humidity were to be maintained.

That this "back heat" control is sensitive is evidenced by the fact that it generally will turn on the heaters while floors are being "damp mopped," or when too many people enter a switchroom at one time. In normal operation, the "back heat" raises the average conditioned room temperature not more than two or three degrees. On one or two occasions, a conditioning unit temperature control has failed to stop the refrigerator unit, allowing it to run continuously; after a few hours the room temperature dropped to about 68 degrees, which is far too cool for comfort with respect to the outside air. During this unusual run, the hygrostat will not turn on the heaters because the relative humidity is lower than 60 per cent, but, as soon as the trouble is corrected to restore the refrigerating unit to proper cycling, the hygrostat

HANG THE LOAD ON HUBBARD HARDWARE
Distributed by 172 Leading Electrical Jobbers located throughout the U. S.
"There is One Near You!"
HUBBARD
HUBBARD AND COMPANY
PITTSBURGH OAKLAND CALIFORNIA CHICAGO
MANUFACTURERS OF A COMPLETE LINE OF HARDWARE FOR TELEPHONE REQUIREMENTS SINCE 1900



CHEMICAL Dehydrators

Automatically controlled, for preventing dampness in automatic telephone exchanges.

Manufactured and sold by

THE H. J. KAUFMAN CO.
13215 ROSELAWN AVENUE
DETROIT 4, MICHIGAN

WE NEED RINGERS AND GENERATORS

3, 4 or 5 bar, for rebuilding, and will buy any you have that are not in use, or we will repair your defective generators and take a part of them in payment for our work.

Write us for full particulars.

WE HAVE FOR PROMPT SHIPMENT—

NEW OAK CABINETS FOR REBUILDING MAGNETO WALL PHONES, of sturdy construction, pleasing appearance and complete with hinges and locks. Inside dimensions: 3½x6¾x16¼, at	3.50
NEW MOUTHPIECES for Western Electric Transmitters	.06
NEW MOUTHPIECES for other makes of Transmitters	.10
NEW RECEIVER SHELLS AND CAPS for Western Electric Receivers	.45
NEW RECEIVER SHELLS AND CAPS, will fit most other Slip Type Receivers	.45
NEW RECEIVER DIAPHRAGMS, per dozen	.35
NEW RECEIVER CORDS (Brown) at	.20
NEW BROWN DESK STAND CORDS (3 conductor)	.45
NEW SWITCHBOARD PLUGS, 2-conductor—No. 42 for Kellogg; No. 47 for Western Electric	.70
REBUILT KELLOGG TRANSMITTERS, without backs or mouthpieces	1.05
REBUILT KELLOGG TRANSMITTERS OR WESTERN ELECTRIC TRANSMITTERS, complete with backs and mouthpieces, at	1.50
REBUILT KELLOGG or WESTERN ELECTRIC RECEIVERS, complete with Cord	1.50
REBUILT INDUCTION COILS for MAGNETO TELEPHONES, to replace Western Electric No. 13 or Kellogg No. 28	.50
REBRAIDED RECEIVER CORDS, Forks and Forks only, per dozen	1.20

TELEPHONE REPAIR & SUPPLY CO.
ROSES PARK STATION CHICAGO 5, ILLINOIS

will turn on the heaters in less than five minutes.

This action clearly demonstrates that cool air cannot hold much moisture and that warm damp air, drawn into a cool room when the refrigerant stops, will almost immediately be at the dew point. To have the heaters come into action at such a time is positive prevention of accidental condensation of moisture on the equipment. In case the refrigeration unit fails to function and the unit fan continues to draw in damp air from the outside, the hygrostat will continue to raise the temperature of the room to prevent any condensation of moisture on equipment that is cooler than the entering air, and, in case the unit refrigeration is off for several hours, the room temperature will continue to rise to hold the humidity at a safe value.

In such conditions, room temperatures have risen to 92 degrees, which are very uncomfortable with higher-than-average humidity, but are still sufficiently dry to maintain proper insulation resistance and to prevent corrosion. In this connection, it is interesting to note that room humidity rises very rapidly when the unit shuts down due to power failure (see hydrograph chart), and when resumed, the humidity drops again very rapidly. With general power failure, the heaters do not function, but neither does the fan run to draw damp air into the room. During sustained power failures of several hours, equipment will have warmed up to the ambient room temperature so that when outside air is admitted for the comfort of personnel, it will not condense on the equipment. During such a period, everything in the switchroom starts to get damp but will dry out very quickly when the dehumidifier is again in operation.

It has been found that switchrooms will function for several weeks without dehumidification before trouble sets in. Coils always go bad first; then the main frame cable heads start to show low insulation resistance. The next trouble will be swelling of the banks, causing the bank clamping screws to fail under tension. By this time, gray whiskers start to appear as a mold on cable runs. Bank contacts and wipers turn green or black, and iron begins to show heavy oxidization and rust. Zinc sulphate forms very rapidly on relay armatures causing them to stick. Plugs will stick in the plug seats until they cannot be pulled out, while all paper drawings and records are just damp rags.

The writer has personally taken a drawing in such condition, wadded it up like a dish cloth and thrown it against the wall to see it stick there for a moment, and then fall with a "slurp." Two switchrooms actually got that wet during installation before dehumidifying equipment arrived. It can be accurately stated, however, that within four hours after the dehumidifier was started, drawings were dry enough to "crackle" slightly, and within a week, all insulation resistance was normal. Corrosion and zinc sulphation was arrested but had to be cleaned off before some of the relays would function. Wooden cases on fire-alarm shelf-mounted apparatus had swollen so badly that it was believed they were beyond repair, but within a month these cases were normal.

When the humidifiers were started in these river-wet switchrooms, moisture collected from the air in a room, 45 ft. long, 24 ft. wide and 12 ft. high, was sufficient to fill a five gallon gasoline tin every four hours for the first two days and tapered down to five gallons per day (24 hours) by the end of the fifth day. Normal operation now runs about one gallon of condensate a day, depending on the amount of air from the outside admitted by personnel traffic through doors and the actual number of personnel present in the dehumidified rooms. It has been observed that, if more than six people are in the rooms at one time, there is a marked increase in the moisture collected on the coils of the dehumidifier. Smoking in dehumidified rooms makes the air foul and is prohibited.

It should be pointed out that it is possible to get switchrooms too dry when using artificial heat to affect low humidity. This is evidenced by insulation on wire becoming brittle and dry-rotting; rubber becomes hard and cracks open. Relay spring insulators and bank contacts become loose. Switch lubricant dries up too fast, while a dry dust starts to be deposited on the bank contacts causing noisy connections. Also, the general dust deposits in the office become excessive. None of these conditions is in evidence in switchrooms dehumidified with the machine refrigeration process where the degree of humidity can be controlled.

Some concern was felt at first about personnel being subject to colds in these dehumidified switchrooms but, as stated previously, no attempt was made to refrigerate the rooms, only to dehumidify them. Inside temperatures are maintained about five to seven degrees cooler than the outside air so that there is no shock to persons entering or leaving the cool rooms. Dehumidified air, at even the same temperature as the outside humid air, is far more comfortable and gives, at first entry, the feeling of being cooler, due to the increased rate of evaporation of mois-

ture from the body. This action is commonly known as "sensible heat," being defined as the heat gain or loss which has the effect of increasing or decreasing temperature.

No attempt has been made to show the intricate thermal calculations that can be made to determine the proper size unit to install in a given location, since the primary purpose was to provide dehumidification only and not cooling. Air circulation to all parts of the switchrooms was of first importance, and it is desirable to maintain an air pressure in the rooms at a fraction of an inch above the outside air pressure to provide some air escape for purely ventilation purposes. Therefore, a unit having a high fan capacity (1,900 c.f.m.) was chosen. Such a unit comes equipped with a heavy duty compressor with an associated large cooling surface of 2.7 sq. ft., which has been found ample, and runs very efficiently.

Air duct systems are very simple and are designed to offer very little friction to the moving air. A three-phase motor for driving the compressor is a necessity, if trouble-free starting, with low motor maintenance, is to be achieved. The fan motor should be single phase and of generous size with built-in thermal protection. Direct connected arrangements may be desirable, but belt-driven fans are giving very good service and allow for easy motor repair when necessary. A belt-driven fan is easy to start with a small motor (one-third to one-half horse power) and requires no special starting gear. Automatic control of all elements is highly desirable in either attended or unattended installations to protect against overload, high or low compressor head pressure, low voltage, water failure or otherwise unstandard conditions.

The heaters should be mounted in the plenum chamber and so wired that the three-phase load will not be unbalanced, but so connected that when the compressor motor is shut off, the heaters cannot be turned on. Where water is at a premium, an automatic water shut-off valve should be installed, controlled by the compressor so that when running, the water flows through the compressor cooling unit, but stopping when the compressor shuts down. All these features are self-contained in the three to four ton commercial units and have been very highly developed to give trouble-free operation for long periods of time.

Close observation of 12 dehumidifying units in as many switchrooms over a period of two years has proved that their use has saved the automatic and associated equipment untold damage

GraybaR SERVICE MEANS A LOT!

● When floods, wind, sleet or fire interrupt communication services — that is when you realize what GRAYBAR Service means. When these emergencies arise, you find GRAYBAR Men working with you, 'round the clock, moving in the supplies you need to get lines back into service.

Before emergencies arise, GRAYBAR maintains stocks of essential items at the highest level consistent with wartime shortages. The network of more than 80 GRAYBAR warehouses, all over the nation, means that in cases where the particular item you need is not available locally, GRAYBAR may be able to get it for you — *fast* — from another warehouse, or from one of the more than 200 manufacturers whose products reach you via GRAYBAR. It means that should the emergency isolate any GRAYBAR warehouse, others take up the burden, and supplies continue to arrive on time.

When it comes to alternates for "impossible-to-get" items, technical understanding of your needs gives authority to suggestions made by GRAYBAR Communications Specialists. The same facilities which enable GRAYBAR to render such outstanding service during emergencies are at your disposal, daily, to help solve less critical telephone supply problems. A GRAYBAR Man near you is ready to make your electrical supply problems his personal responsibility. Why not take advantage of his time-saving assistance? 5518

GraybaR 75 YEARS OF Electrical Distribution

IN OVER 80 PRINCIPAL CITIES

Executive Offices: GRAYBAR BUILDING, NEW YORK 17, N. Y.

Leaders in

Precision Engineering

Murdock

TELEPHONE SETS

You get *extra* durability—clear, sensitive tone reproduction — handsome modern design — in these always dependable sets. For 40 years MURDOCK has rated A-1 with telephone technicians.

WRITE FOR Catalogue of Murdock Telephone Sets, Plugs, Push Buttons, Connection Blocks and Radio Phones.

WM. J. MURDOCK CO.
152 Carter St., Chelsea 50, Mass.

NAUGLE
PENTA POLES
(NORTHERN WHITE CEDAR)
FULL LENGTH TREATED

PENTA POLES GIVE YOU—

that extra something pole producers have attempted to accomplish for years. . . . The toxic potency of Pentachlorophenol is so great, this full length treatment positively makes the sapwood EVEN MORE RESISTANT to decay than the heartwood . . . resulting in many EXTRA years of trouble-free service added to the already unexcelled long life of natural Northern White Cedar Poles.

We will be happy to make quotations.

•

NAUGLE POLE AND TIE CORP.
WESTERN & NORTHERN CEDAR POLES
317 PLYMOUTH BLDG. · MINNEAPOLIS

from the effects of moisture. Switchrooms and operators' rooms are clean, comfortable and healthy. Maintenance has been greatly simplified and improved. Cords on operators' positions last six to nine months without repair, while previously, in rooms which were not dehumidified, cords were good for less than a month. The saying that "Everyone talks about the weather but no one does anything about it" has been changed to "Everyone complains about the switchroom weather if nothing is done about it."

V V

E. E. Ringrose, Wisconsin Telephone Man, Dies Suddenly

E. E. Ringrose, former auditor of the Community Telephone Co. of Wisconsin, Black River Falls, and recently superintendent of public utilities of New Richmond, died November 23 at a Madison, Wis., hospital. Death was due to a complication of diseases which followed a severe case of pneumonia. He was 43 years old.

Everett Elland Ringrose, only son of Charles E. and the late Charlotta Newton Ringrose, was born May 8, 1901, in Alma Center, where he spent his boyhood and graduated from the Alma Center High School. He later took a business course in Appleton and was an alumnus of Marquette University, Milwaukee.

For 20 years he was associated as manager and auditor with the Community company at Black River Falls. His father was an officer of the Central Wisconsin Telephone Co., Inc., and E. E. Ringrose became familiar with the work when a very young man. When the Community Telephone Co. of Wisconsin acquired the Central Wisconsin company holdings, Mr. Ringrose was taken into the company and became its auditor.

When the state law required the appointment of utility commissions to take charge of municipal utilities, he was appointed one of the first members of the Black River Falls Commission. For nine years he was president of the Black River commission and acted as supervisor. He resigned in 1941.

In September, 1943, he personally purchased the Spring Valley, Wis., telephone company and had been operating it in connection with his other work.

He is survived by his widow, two children and father.

V V

Nominated Director

JAMES F. CARROLL, president of the Indiana Bell Telephone Co., recently was nominated to a three-year term as a member of the board of directors of the Indianapolis Chamber of Commerce.

Look to Suttle for TELEPHONE PRINTING of all kinds

There's no need for you to worry around trying to get your special telephone printing such as billing supplies and office record forms. Check up on Suttle's specialized service.

WE KNOW WHAT TELEPHONE PRINTING IS ALL ABOUT!

You don't have to write a long letter and give a lot of explanations when ordering your printing from us. Just mail your copy and note on it how many you want. We understand your requirements and will deliver material just as you want it—promptly.

Printing Department

SUTTLE EQUIPMENT COMPANY
Lawrenceville, Illinois

SINCE 1889
NATCO
CLAY CONDUIT

The proved and standard Protection for Underground Telephone Cables.
Cheapest in the long run. Highest quality and a full line of shapes.

National Fireproofing Corp.
202 E. Ohio Street, N. S.
PITTSBURGH, PA.

MAIN FRAME MAINTENANCE: Careful main frame maintenance will do much to keep trouble down in any telephone exchange. All jumper wires should be run through their proper rings and fanning strips with all connections soldered. A small amount of slack should be left in each jumper so that cable pairs may be changed, if necessary, without replacing the jumper. The above photograph shows a well-maintained and trouble-free main frame.

Telephone in Hand, Fights Monkey on Leyte

Rifle in one hand, telephone in the other, Corp. Mills H. Stephens, from Raleigh, N. C., now stationed at Leyte, P. I., called his command post from a water-filled foxhole south of Ormoc on November 21: "There's something outside my hole. . . ."

The sound of a scuffle carried over the telephone.

"Something hit me on the shoulder. I grappled with it, then it jumped off," Corporal Stephens resumed. "I knew it was too fast for a Jap, and I took another look. It was a monkey."

V V

OBITUARIES

HENRY G. BEAM, 58, Mt. Vernon, Ohio, died recently after four days' illness with pneumonia. He was vice president of the Mt. Vernon Telephone Corp., which was founded by his father, Frank L. Beam.

* * *

ELSIE CLOSE of the Shelby (Ohio) Telephone Co. died October 5 at the age of 74. She was employed as bookkeeper by the Shelby company for 29 years.

V V

Promoted to Captain

WILLIAM S. GARD, formerly with the Ohio Independent Telephone Association, recently was promoted to captain. Captain Gard is now with the Third Army in France.

You'll Want "The Last Word" In Utility Bodies And Equipment for Your Post-War Activities!

The "AMERICAN" Replacement Plan Assures Your Getting Just Exactly That.—

. . . Writes the Supt. of Transportation of A Progressive Western Power Company: - - -

.. "We have 7 American Coach bodies on our system now. "One of my recommendations for post-war planning will be that we standardize on American Coach bodies. The first ones we bought in 1934 are still in service and in good condition, so we know they are good."

After the war is over transmission and distribution lines are going to need a lot of replacement and in order to do these jobs efficiently and speedily and meet the pressing demand Utilities are going to need much new equipment to replace and augment their present over worked war-weary equipment — *And these Utility bodies and equipment will be wanted RUSH.*

• Appreciating this many companies are taking advantage of the AMERICAN COACH REPLACEMENT PLAN and getting set for early deliveries quickly after chassis are released by the government.

• It will pay you to get the full information about this plan — Write today — There's no obligation —

Some Reasons Why "Americans" Are TOPS: —

Correct Design • Superior Quality Construction • Comfort • Convenience • Safety • Endurance • Low Operating Cost • Fine Appearance

BUY MORE WAR BONDS

THE American COACH & BODY CO.

PUBLIC UTILITIES EQUIPMENT FOR MOTOR VEHICLES

IMPROVE PARTY LINES

ELIMINATE NOISE
with the
Improved RTC-2 VINCENT
RARE GAS RELAY
for harmonic or coded bells

Dual purpose device which economically improves both ringing and transmission on party lines.

NO MOVING PARTS.
Fully Guaranteed.
Can be installed in a minute

Write for Catalog 39-A describing
Non-Grounding Rare Gas Arresters
Terminal Strips • Potheads • Housings

L. S. BRACH Mfg. Corp.
55-63 Dickerson St. Newark, N. J.
Signal Circuit Engineers Since 1906

TELEPHONE
DIRECTORY
PRINTING

It is accurate printing and efficient printing.

The Cuneo Press, Inc. has had years of experience in the field of printing telephone directories.

Large proof reading staffs — suitable equipment — complete shipping facilities.

THE CUNEO PRESS INC.
CHICAGO, ILL.
WITH CONVENIENT PLANTS
NEW YORK PHILADELPHIA
MILWAUKEE

Managers Close 18 Year Career; Montville, Ohio, Company Sold

Mr. and Mrs. E. J. Bremner, in charge of the Montville (Ohio) Citizens Telephone Association for the past 18 years, resigned recently.

Officers of the company have announced sale of the property to Rufus G. Hulbert, manager, The Thompson (Ohio) Telephone Co. Mr. Hulbert, who owns a controlling interest in the Thompson company, took possession about September 1. He plans to modernize the system.

V V

Western Electric Observes Its 75th Anniversary

Last month, nearly 100,000 men and women, comprising the nationwide family of the Western Electric Co., will observe the organization's 75th anniversary. Western Electric, the manufacturing, purchasing and supply unit of the Bell System, has become, during World War II, one of the nation's largest producers of communications and electronic equipment for the armed forces.

As part of the anniversary observance, employes of the company in key cities from coast to coast previewed a feature-length motion picture, entitled "Heritage For Victory," which dramatized the growth of the organization over three quarters of a century and demonstrated how the cumulative skill, technique and experience, gained through 75 years, have made it possible for Western Electric to meet the challenge this war has imposed upon it.

"Heritage For Victory" was specially produced in Hollywood by Wilding Picture Productions, Inc., for showing to Western Electric employes. Superficially considered, it was the story of Western Electric, but its theme transcended the work of a single organization. In a broader sense, it was the story of American faith and determination on the job on all fronts. These spell certain victory.

V V

Philco Appoints C. W. Johnson Connecticut Representative

Appointment of Clifford W. Johnson as sales representative in Connecticut of the Philco Storage Battery Division recently was announced by J. C. Green, assistant division manager. Mr. Johnson will have his headquarters in the New York City office, 373 Fourth Ave.

A 1928 graduate of Lehigh University with the degree of engineer of mines, Mr. Johnson spent several years in Mexico as chemist and assayer for the American Smelting & Refining Co. He returned to the United States in 1936 to join the Goodman Manufacturing Co.

FOR
LACING CABLES
and all other purposes requiring a superior waxed twine.

THE BARBOUR PRODUCTS
Division of
THE LINEN THREAD CO., INC.
60 East 42nd St., New York 17
Boston (10) Chicago (10) San Francisco (3)
Gloucester Philadelphia (6) Baltimore (3)

CHANCE
STEEL ANCHORS
expand deep
into solid earth
The blades of Chance Steel Expanding Anchors cut deep and straight into solid earth with a minimum of soil disturbance. On the average, these anchors expand to 2½ times their original size and the pull in solid earth is well balanced because there is no side twisting during expansion. The nut retainer aids expansion and permits salvaging the rod or driving it down. Get the details.
A·B·CHANCE CO·
CENTRALIA, MISSOURI.

as sales manager. For the past two years he has been connected with the War Production Board.

V V

E. R. Yonkers Appointed Graybar Manager at Omaha

On November 1, E. R. Yonkers of Kansas City, Mo., was appointed to the position of Graybar manager in Omaha, Neb., replacing T. W. Conrad who has retired on a service pension.

Mr. Yonkers started his career with the company as a salesman at Wichita, Kan., in 1933. The following year he was moved to district headquarters in Kansas City, and in 1939 became lighting manager there. In 1940 he was appointed manager of the outside construction and supply departments; in February of this year, he moved to Omaha as acting manager.

V V

Leeds & Northrup Issue Catalog of Products

Industrial men who have a problem which must be solved through the use of measuring instruments and controls, will be interested in Leeds & Northrup Co.'s recent publication, *Modern Precision*, which briefly describes *all* of the company's products for regulating plant processes.

Because so many of these processes depend on close temperature regulation, one section of this 28-page general catalog issue of *Modern Precision* describes the instruments for measuring by each of the company's four pyrometric methods: Thermocouple, rayotube, thermohm and optical. For other plant processeses, equipment which measures such quantities as PH, speed, gas analysis, etc., are described. A large chart shows the particular instrument model which is available in each case; installation photographs show the equipment in service.

Another section is devoted exclusively to a discussion of heat-treating furnaces. Also described, in still another section, are the laboratory instruments. And there is a description, too, of equipment widely used for increasing power plant efficiency, the company reports.

Copies of this publication may be received by writing Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa. Be sure to specify Folder ENT(7a).

V V

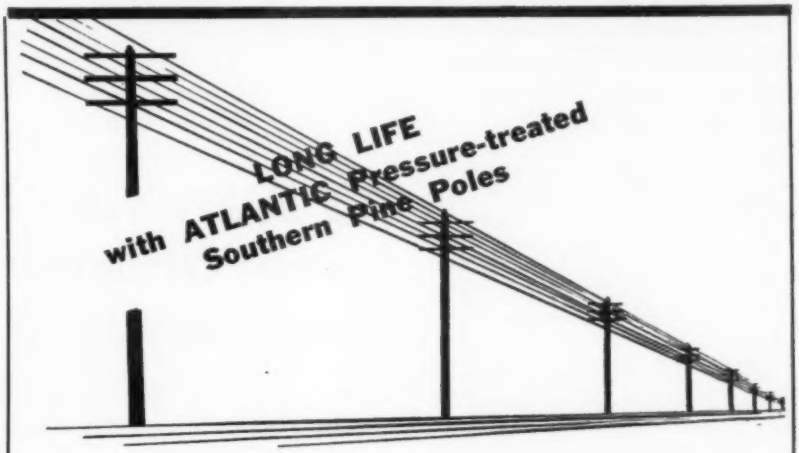
U. S. Rubber Appoints Two Executives for New Posts

Ernest G. Brown, general manager of the mechanical goods division, United States Rubber Co., recently announced the appointment of Herman A. Everlien as general sales manager

LINEN LACING TWINE

Now and After The War You Will Surely Want to Use **Armature Brand** Manufactured to Meet Your Requirements

EDERER, INC.
PHILADELPHIA 24, PA.
H. S. Clark & Son, Chicago 6 — F. J. Fawcett Inc., Boston 11 — Hayne-Surridge Co., St. Louis 3 — H. H. Kemper Co., Cincinnati 2



ATLANTIC CREOSOTING CO., INC.
NEW ORLEANS, LA. — WINNFIELD, LA. — NORFOLK, VA. — ANNAPOLIS, MD. — JACKSON, TENN. — LOUISVILLE, MISS. — SAVANNAH, GA. — BOSTON, MASS. — NEW YORK, N. Y. — PHILADELPHIA, PA.

Answers to Traffic Questions on Page 74

(1) The rate in effect at the originating point, that is, the day rate will apply.

(2) After word has been left at the called station, if the calling party clearly indicates that he wishes you to wait for a WH report instead of making the usual subsequent attempt, "hold for WH" is entered on the ticket.

(3) The same ticket should be used.

(4) The MX precedence order is left with the intermediate ringdown tributary operator. If necessary, explain that you will hold the circuit and that the call takes precedence over regular calls.

(5) This action is not necessary.

of the division and Walter F. Spoerl as merchandise manager. Both positions are newly-created.

Mr. Everlien has had more than 41 years' experience in the mechanical rubber goods industry, Mr. Spoerl, 36 years. Both men began their careers at early ages as clerks in the sales department of the old Revere Rubber Co. in Chicago, later consolidated into the United States Rubber organization.

MacGillis & Gibbs Buys Northern Michigan Property

J. Harold Bumby, president of the MacGillis & Gibbs Co., Milwaukee, Wis., recently announced the purchase by that company of 5,000 acres of cedar lands, the Ensign concentrating yard and logging equipment from Skaug Brothers of Escanaba, Mich.

Mr. Bumby states that the MacGillis & Gibbs company now will have access to more cedar poles, of which there is a shortage. Three active concentrating yards in Upper Michigan, supervised by the office at Gladstone, Mich., are now owned by the company.

Buying agencies for white cedar poles also have been opened at Grand Rapids, Deer River, Great Falls and Little Fork, Minn., the president said.

dependable
Cedar Poles
MICHIGAN POLE & TIE CO.
NEWBERRY—GRAND RAPIDS
MICHIGAN

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

C. M. Christiansen Co., Phelps, Wis.—Northern White Cedar Poles, plain or butt treated. Quotations on request.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

Pensacola Creosoting Company, Pensacola, Fla. — Creosoted Southern Pine Poles of Superior Long Leaf Quality.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

Are MANPOWER Troubles Cutting Your Directory Adv. Sales?

★ We have the MANPOWER, the EXPERIENCED ORGANIZATION to take over your Telephone Directory Advertising, handle all details and produce MORE NET revenue (all costs considered).

Write or call at our expense.

LOOMIS ADVERTISING CO.
408 OLIVE STREET, ST. LOUIS, MO.
New York Life Building, 20 W. Ninth St., Kansas City, Missouri
Citizens Trust Bldg., Fort Wayne, Ind.
135 So. Second Street, Philadelphia, Pa.

ATLANTIC
Creosoting Co., Inc., 17 Battery Pl., N. Y. C.
Creosoted Pine Poles
Crossarms . . Conduit
PLANTS AND OFFICES:
New Orleans, La. Jackson, Tenn. Boston, Mass.
Winnfield, La. Louisville, Miss. New York, N. Y.
Norfolk, Va. Savannah, Ga. Philadelphia, Pa.
Annapolis, Md. Chicago, Ill.

Cedar Poles
MAC GILLIS & GIBBS COMPANY
Wells Bldg., Milwaukee 2, Wis.
★ ★
Northern White and Western Red Cedar Poles—Plain or Butt-Treated

Frank F. Fowle & Co.
Electrical and Mechanical ENGINEERS
35 East Wacker Drive CHICAGO

ACCOUNTING
HERDRICH, BOGGS and CO.
Certified Public Accountants
803 Electric Building
INDIANAPOLIS 4, IND.

SLOAN & COOK
CONSULTING ENGINEERS
120 SOUTH LA SALLE STREET
CHICAGO
Appraisals—Original Cost Studies
Depreciation, Financial, and Other Investigations

NEW OAK CABINETS, ALL SIZES AND TYPES, TELL US YOUR REQUIREMENTS
TELEPHONE CABINET CO.
MAKERS OF TEL-PAX CABINETS
633 PROSPECT KANSAS CITY 1, MO.

J. W. WOPAT
Consulting Engineer
Telephone Engineering
Construction Supervision
Appraisals—Financial
Rate Investigations
1810 Lincoln Bank Tower Fort Wayne, Ind.

J. G. WRAY & CO.
TELEPHONE ENGINEERS
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies
3334 Bankers Bldg., Chicago

Classified Section

Rates 10 cents per word payable in advance.
Minimum charge $2.00 for 20 words or less.

HELP WANTED

WANTED: By telephone company in Middle West, experienced repairmen and linemen. Good salary for men who can qualify. Furnish full details of experience, draft status, etc. Statement of availability required. Write Box No. 2126, c/o TELEPHONY.

TRAFFIC MAN WANTED by Class A company in Middlewest. Prefer an experienced man who can do quantitative engineering but will consider inexperienced person with previous telephone experience. Permanent position. Good salary for man who can qualify. Furnish full details of experience, draft status, etc. Write Box 2108, c/o TELEPHONY.

WANTED: Telephone Accountant—qualified to supervise all phases of telephone accounting for Class A companies. Give full information as to age, experience, draft status, etc. Attach small photograph. Write Telephone Services, Inc., 16th Floor, Lincoln Tower, Fort Wayne, Indiana.

WANTED: Agent for exchange in southern Missouri. Suitable especially for man and wife arrangement. Small modern living quarters in exchange building. Call or write Missouri Telephone Co., 15 S. Seventh St., Columbia, Mo.

FOR SALE

FOR SALE: Telephone plants in West Virginia serving railroads and coal companies. 775 telephones, gross revenue, $75,000. The possibilities of 150,000 acres of coal land being developed will double size of telephone plant. Write Telephone Company, Box 173, Oak Hill, W. Va.

POSITIONS WANTED

POSITION WANTED: Permanent. As manager of locally-owned exchange or group, where broad experience can be put to full use. Any size over 1,000 stations. North central states preferred. Please give pertinent details, including salary range, in first letter. Write Box No. 2128, c/o TELEPHONY.

POSITION WANTED: By thoroughly experienced telephone man, 29 years in central office and plant installations, maintenance, construction, commercial and management. Location no object, available at once. Write Box No. 2127, c/o TELEPHONY.

WANTED TO BUY

WANTED TO BUY: By individual, telephone exchange or small group of, from 400 to 1000 stations, preferably in Middle West. Write Box 2124, c/o TELEPHONY.

RECONDITIONED

RELAYS FOR PROMPT SHIPMENT

KELLOGG W. E. CO.
STROMBERG - CARLSON
AUTOMATIC ELEC. CO.
DEAN MONARCH

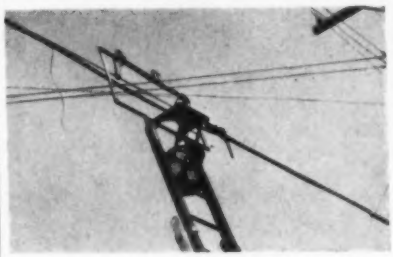
LINE CUT OFF
TRUNK CORD
POLARIZED MECHANICAL
SELECTOR CONNECTOR
REPEATER LINE SWITCH

COILS SPRING ASSEMBLIES MOUNTINGS

PRICES ON REQUEST

BUCKEYE TELEPHONE and SUPPLY COMPANY
COLUMBUS 6, OHIO

SPECIAL LADDER FOR CABLE SPLICING



This cable splicing ladder was brought to our attention by Chas. F. Robinson, Signal Corps telephone engineer of the Fourth Service Command, Atlanta, Ga. Credit for the development goes to Earl Humphries, Columbia, S. C., cable supervisor, Southern Bell Telephone & Telegraph Co.

Because of the present wartime labor shortage, cable splicers are often required to clear trouble without the assistance of a helper. When trouble is located in the center of a span, a ladder is often used to clear it in order to avoid the work of swinging a platform. When an ordinary extension ladder is placed against a messenger strand, the space in front of the splicer is blocked by the side pieces and rungs of the ladder. This makes it necessary to lean to one side to make repairs, which is both difficult and dangerous.

Mr. Humphries, realizing the difficulties experienced by cable splicers with the ordinary type of ladder, developed the idea of the framework arrangement shown in the accompanying photograph. This provides clear working space directly in front of the worker. The seat is an old idea but works with this special ladder. The seat may be raised or lowered as desired. Note that the top of the ladder is strapped to the frame.

V V

Wounded in Action

D. P. NEWELL, vice president, Northeastern Telephone Co., Augusta, Ky., recently was notified by the War Department that his son "DOUGGIE" was seriously wounded in action in Germany on September 26.

Modern Maxim

Some men think it's their work that is burdensome, when it's the chip on their shoulder that's holding them down.

SAVE THE POLES

• The Sturd-E exclusive Multipoint Cant Hook speeds up pole handling and saves the poles—its six quarter-inch by half-inch points grip much more firmly than a single point—in addition, they do not penetrate the creosote treatment. Result—no deep stab wounds where water collects and rot can start.

Made in three sizes for handling all poles—from the smallest to the big ones 22 inches in diameter. Every utility that has tested the Multipoint Cant Hook has reordered in ever increasing numbers—it saves poles, time, and cost.

STURD E TOOLS
a TRUE TEMPER PRODUCT

MULTIPOINT CANT HOOK

6 points, ¼" x ½" in size grip the pole securely but leave no deep hole to encourage rot and decay. Points renewable when worn. Furnished in small, medium and large sizes for handling poles up to 22" in diameter. Prices and complete description on request.

Distributed by
JOSLYN MFG. & SUPPLY COMPANY
Executive Offices
20 North Wacker Drive • Chicago, Illinois
Branches and Warehouses with Complete Stocks in Principal Cities of the United States

Index to Advertisers

	Page
Acme Visible Records, Inc.	—
Acorn Insulated Wire Co., Inc.	57
Addressograph Multigraph Corp.	—
Air Reduction Sales Co.	—
Allen, L. B., Co., Inc.	7
American Coach and Body Co., The	93
American Condenser Corp.	—
American Appraisal Co., The	—
American Creosote Works, Inc.	—
American Crossarm & Conduit Co.	—
American Cross-Arm, Inc.	—
American Fork & Hoe Co., Inc.	98
American Steel & Wire Co.	—
American Telephone & Telegraph Co.	—
Armstrong Cork Co., Whitall Tatum Glass Insulators Dept.	7
Associated Telephone Engineers' Soc.	—
Atlantic Creosoting Co., Inc.	95, 96
Audio Development Co.	70
Automatic Electric Sales Corp.	8, 9, 50-51, 77, 99
Barco Manufacturing Co.	—
Bartlett Mfg. Co.	—
Berry & Co., L. M.	87
Bethlehem Steel Co.	—
Brach Mfg. Co., L. S.	94
Buckeye Telephone & Supply Co.	97
Cable Spinning Equipment Co., The	10, 73
Calculagraph Company	43
Carney & Co., B. J.	96
Chance Co., A. B.	94
Christiansen Co., C. M.	96
Churchill Cabinet Co.	—
Coffing Hoist Co.	80
Cleveland Trencher Co.	53
Colfax Lumber Co.	—
Cook Electric Company	7, 83
Copperweld Steel Co.	Back Cover
Cuneo Press, Inc., The	94
Davison Chemical Corp., The	—
Defiance Alloyed Products Co.	—
Dicke Tool Co.	—
Dictaphone Corp.	—
Donnelley & Sons, R. R.	—
Ederer, Inc.	95
Electric Products Co., The	—
Electric Storage Battery Co., The	—
Estwing Mfg. Co.	—
Everstick Anchor Co.	—
Fahnestock Mfg. Co., Inc.	—
Fansteel Metallurgical Co.	—
Forged Steel Products Co.	76
Four Wheel Drive Auto Co., The	85
Fowle & Co., Frank F.	96
Gary Service & Investment Co.	48-49, 81
General Cable Corp.	—
General Electric Co.	81
General Insulated Wire Works, Inc.	82
General Telephone Directory Co.	—
Graybar Electric Co., The	91
Gray Manufacturing Co., The	13
Hallicrafters Company	37
Hammond Drierite Co., W. A.	88
Hart and Co., Frederick	—
Herdrich Boggs and Co.	96
Hexacon Electric Co.	—
Highway Trailer Co.	35
Holtzer-Cabot Electric Co.	79
Homelite Corporation	55
Hubbard & Co.	12, 89
Hunter & Co.	69
Indiana Steel & Wire Co.	6, 67, 78
International Creosoting & Construction Co.	96
International Telephone & Telegraph Corporation	—
Johns-Manville	39
Joslyn Mfg. & Supply Co.	—
Ka-Mo Tools, Inc.	—
Kaufman Co., H. J.	90
Kellogg Switchboard & Supply Co.	4, 5, 6, 7
Kester Solder Corp.	—
Klein & Sons, Mathias	68
Koppers Co.	14
Leeds & Northrup Co.	84
Leich Sales Corporation	—
Lenz Electric Mfg. Co.	77
Line Material Co.	—
Linen Thread Co., Inc., The	94
Loomis Advertising Co.	96
Lorain Products Corporation, The	63
MacGillis & Gibbs Co.	96
Mathewson Company, E. B.	—
Matthews Corp., W. N.	—
Michigan Pole & Tie Co.	96
Morley Co., The	—
Moss Tie Co., T. J.	67
Murdock Co., Wm. J.	92
National Carbon Co., Inc.	6, 41
National Fireproofing Co.	92
National Telephone Supply Co.	77, 86
Naugle Pole & Tie Co.	92
North Bros. Mfg. Co.	75
North Electric Mfg. Co.	11
Oliver Iron & Steel Corp.	—
Overton Co., S. E.	—
Owens-Illinois Glass Co., Hemingray Division	74
Page & Hill Co.	—
Paper Manufacturers Co.	—
Paragon Electric Co.	—
Partridge Lumber Co., T. M.	96
Pensacola Creosoting Co.	96
Plastic Wire & Cable Corp.	—
Philco Corp. (Battery Division)	18
Phillips Electrical Works, Ltd.	—
Porcelain Products, Inc.	6
Porter, H. K., Inc.	72
Premax Products, Inc.	—
Raytheon Mfg. Co.	45
Ray-O-Vac Company	65
Rebuilt Electric Equipment Co.	—
Reliable Electric Co.	7, 73
Remington Rand, Inc.	—
Rhodes & Sons, M. M.	—
Roeblings Sons Co., John A.	—
Runzel Cord & Wire Co.	17
Schauer Machine Co., The	—
Schollhorn Co., Wm., The	72
Seymour Smith & Sons, Inc.	—
Sloan and Cook	96
Southern Electric & Transmission Co.	59
Stephens Co., E. W.	—
Sterling Engine Co.	15
Stromberg-Carlson Company	2, 3, 67, 73
Sturgis Posture Chair Co.	—
Suttle Equipment Co.	92
Taylor-Colquitt Co., The	63
Telephone Cabinet Co.	96
Telephone Repair and Supply Co.	90
Texas Creosoting Co.	—
Union Carbide & Carbon Corp.	41
United States Motors Corp.	84
United States Rubber Co.	16
United States Steel Corp.	—
Valentine Clark Corporation	96
Vulcan Electric Co.	—
Webster Electric Co.	71
Western Electric Co.	—
Weston Electric Instrument Corp.	61
Whitney Blake Co.	35
Wiremold Co., The	—
Wopat, J. W.	96
Wray & Co., J. G.	96
York-Hoover Corp.	33
York Investment Co.	—